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ORIGINAL ARTICLES

CHRONIC INTESTINAL DYSPEPSIA OF CHILDREN*

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In one's work in the out-patient department of a children's hospital, one is struck by the very large number of children between the ages of four and ten who are brought to the doctor with a group of symptoms which does not fall under the heading of any of the diseases commonly described in medical text-books. On studying these cases, one finds that in a fully-developed example there is a well-marked and fairly constant symptom-complex which, in lack of a better name, I propose to call the Chronic Intestinal Dyspepsia of Children.

Before proceeding further, it may be well to describe a typical case:—

A boy, aged eight, is brought to the hospital; his mother states that he is wasting, "has no life in him," "is very nervous," "has a headache in the morning," "suffers from pains in the chest," "has a bad cough, and seems to be in consumption." When interrogated as to the duration of the illness, she states that he has always been weakly, but has been worse the last few months. On examination, we find that the child is very thin, but is not emaciated, that he has a sallow complexion, dark rings round the eyes, and anemic conjunctivæ. The chest is found to be perfectly healthy, though badly developed, on account of the presence of adenoids and enlarged tonsils. The "pains in the chest" are found really to proceed from the epigastric region. The tongue is slightly furred, and several carious teeth are present. On questioning the mother, we learn that the child is very restless at night, suffers from night terrors, and awakes tired, languid, and with frontal headache. He frequently has attacks of cramp-like pain in the epigastric region, is nervous, and cries very easily. His appetite is very poor and distinctly capricious. Some slime and a number of thread-worms have been noticed in his motions. In other words, and even more briefly, the typical case is that of a child about the period of the second dentition with the symptoms of wasting, languor, nervousness, frontal headache, epigastric pain, deranged appetite, cough, and nocturnal restlessness, accompanied by some of the other signs or symptoms already mentioned.

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* *Edinburgh Med. Journal,* Advance Sheets.

From this description it is seen that it is from symptoms much more than from signs that the clinical picture of the disease is drawn. It may, with some justice, be argued that there is no definite proof that the condition is really one of chronic intestinal dyspepsia, or, at any rate, that chronic intestinal dyspepsia is the primary factor of the disease. To some extent this objection is, unfortunately, true. At the same time it is of the utmost importance that we have some name for the disorder—a name which will enable us to have a clear mental picture of the group of symptoms, but which will not be capable of too wide an application, as would be "the marasmus of childhood"—and will not bind us to any preconceived idea as to the etiology of the condition—as do the names "lithemia," "neurasthenia," and "mucous disease."

The importance of the recognition of this condition as a definite clinical entity is very great, and this for three reasons.

In the first place, it is an exceedingly common condition. Carr,[1] in an article on "Chronic Dyspepsia in Children," in which he discusses this condition, says that "in the ordinary routine of hospital out-patient work among children of say, from 2 to 10 years of age, a very large proportion, if not the majority, of the cases, are brought for digestive disturbances or their consequences." I would go further, and say that, of the children between 3 and 12 years of age seen in the out-patient departments in London, two-thirds of them are suffering from "digestive disturbances or their consequences." Almost half of these present the typical symptoms of the condition which is now under consideration.

The second reason is that, by correctly diagnosing the disease, one can at once reassure the relatives as to the prognosis of the child's condition. The symptoms often closely resemble those of tuberculosis,—general tuberculosis, phthisis, or *tabes mesenterica*,—and the mother's fears are too frequently increased by her medical man, who may tell her either that the child is "going into a decline," or, actually, that the child has consumption.

The third, and even more urgent reason for the importance of the recognition of the condition, lies in the fact that by correctly diagnosing the disease one radically alters the treatment, and, instead of stuffing the child with food and drenching him with cod-liver oil and syrup of hypophosphites,—which both tend to aggravate his condition,—one can, by suitable dietetic and medicinal means, comparatively quickly arrest a condition which otherwise would probably continue to a greater or lesser extent for years, and, by lowering the general vitality of the patient, would render him more liable to intercurrent disease and its consequences.

In most of the standard books on medicine, little or nothing is said about the condition. Even in books devoted to the diseases of children the information is most meagre. There is, however, one notable exception, Eustace Smith,[2] in "The Wasting Diseases of Children," gives a full and very accurate description of the malady under the heading of "Mucous Disease." Another excellent account of the disease is given by Carr[1] under the title of "Chronic Dyspepsia in Children." Quite recently, too, Hutchison[3] gives a short, but at the same time comprehensive, account of the disorder. It is probably the most accurate description of the condition yet given. In most of the text-books, however, the symptoms which make up the clinical picture of the malady are each described as a separate disease, and their relationship to one another is ignored, and, consequently, the view is narrowed and the treatment recommended is mainly symptomatic. It is, to say the least of it, surprising to find that such an extremely common malady is so little recognized, and, as far as I am aware, no attempt has hitherto been made to collect a series of typical cases and to tabulate and analyze the symptoms, although it is obvious that this is the only way by which we can verify our opinions and increase our certain knowledge of the condition. I have accordingly made full notes of fifty typical cases seen at the Out-Patient Department at Great Ormond Street Children's Hospital,* and have followed their after-history for periods varying from a few months to over three years.

The fifty children of whom particulars were collected were selected as being fairly typical examples of the disease when at its worst. In considering the following statistics, we must remember that it is only with pronounced cases of the complaint that we deal, and that innumerable children have its symptoms to a lesser extent, but that, from one cause or another, it does not assume the severe form of the full-blown case which we shall consider.

I have intentionally selected only the severest cases, because one must first have studied the typical case, before one can recognize and properly treat the milder forms of the disease.

The following are the main facts elicited in the study of the fifty cases I have investigated:—

ETIOLOGY AND DURATION OF THE DISEASE.—*Parent's wages.*—In his most interesting and instructive book, "Poverty," Rowntree[4] defines "primary poverty" as that occurring in "families whose total earnings are insufficient to obtain the minimum necessaries for the maintenance of merely physical efficiency." In York, he found that primary poverty occurred, unless a family of five persons, paying a weekly rent of 4s., earned at least 21s. 8d. per week. Calculating from these figures, I found that the parents of 16 of my series of 50 children were in primary poverty. It must be stated, however, that in my figures the wages earned per week did not include moneys earned by members of the family other than the chief bread-winner. The patients' mothers, too, in order to be certain of being allowed a hospital letter, probably frequently understated their husbands' weekly wages, and that this occurred was borne out from the fact that several mothers placed their weekly income at a higher figure to me than they did to the clerk from whose books my statistics are taken. On the other hand, these figures do not take into account "secondary poverty"—that is, poverty occurring in "families whose total earnings would be sufficient for the maintenance of merely physical efficiency, were it not that some portion of it is absorbed by other expenditure, either useful or wasteful." There can be no doubt, therefore, that the parents of a consideable number of the children in my series of cases were in such a condition that they had not "sufficient for the maintenance of merely physical efficiency." It is questionable, however, if the percentage was greater than it is in the general population. Rowntree found in York that 27.28 per cent. of the total population were living in primary or secondary poverty, and Booth[5] estimated the percentage in London at 30.7. He also considers that "other cities, if similarly tested, would show a percentage of poverty not differing greatly from that existing in London."

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* One case was seen at the West London Hospital, and one at the Margaret Street Hospital for Consumption.

That such poverty has a detrimental effect on the physical condition of the children who suffer from it, stands to reason, and if proof of it were wanted, it is admirably supplied by Rowntree in Chapter V. of his book, in which, by actual weights, measurements, and statistics, he shows how much poorer are the development and prospect of life of children suffering from "poverty" than of children with sufficient and proper nourishment. On the other hand, that chronic intestinal dyspepsia of children is by no means limited to the poor, can be at once affirmed by any practitioner attending the poor or middle classes, who can recognize the symptoms of the disease. Parents whose means will allow of it are apt to indulge their children in many ways that may predispose them to the disease, and this the poverty of the poorer classes forbids.

In my cases* the wages earned were as follows:—

Class A.	(four to six of a family)*	less than 18s.	per	week,	1
" B.	" "	18s. to 21s.	"	"	11
" C.	" "	21s. to 30s.	"	"	27
" D.	" "	over 30s.	"	"	4

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* Particulars were not obtained in all fifty cases.

The condition as to room accommodation in my series of cases was as follows:—

In two cases there was less than 1 person to each room.
In four cases there was 1 person to each room.
In twelve cases there were more than 1 person and less than 2 to each room.
In nine cases there were 2 persons to each room.
In seven cases there were more than 2 persons and less than 3 to each room.
In four cases there were 3 persons to each room.
In three cases there more than 3** persons to each room.

There was no apparent relationship between over-crowding and the presence of adenoids and enlarged tonsils, night terrors, or morning headaches.

In regard to locality, as was only to be expected, the great majority of the cases came from London and its suburbs. Four, however, were country children; and one of these came from Haslemere, in Surrey—a locality accounted to be the healthiest in the southeast of England.

In order to find if chronic intestinal dyspepsia were more frequent in town than in country children, as well as to contrast the two classes generally, I have begun an examination of a large number of cases from both areas, but the investigation is not sufficiently advanced to allow of its incorporation in the present work. It would seem, however, that the disease is fairly common in children living in the heart of the country, and probably it will be found that the question of town or country life has little influence in its causation. At the same time, there can be little doubt that the stimulating objective life of the town exaggerates the nervous phenomena of the disease; and that this combined influence tends to produce the person "stunted, narrow-chested, easily wearied; yet voluble, excitable, with little ballast, stamina, or endurance,"[6] who is so typical of the lower-class town life of to-day.

Race.—In my series of cases several nationalities were represented. Their relative frequency probably fairly accurately represents the percentage of their ordinary incidence in all cases coming for advice to Great Ormond Street Hospital.

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* If the entire family numbered less than four, a certain sum was added to the weekly income for each person less than that number, and the converse was done if the family exceeded six.

** In one of these instances, two of the cases—brother and sister—were members of a family of seven living in two rooms. In the other instance, a family of four lived in one room.

Town and country life of ancestors.—According to Cantlie,[7] a third generation of pure Londoners of the lowest classes is almost unknown. Other observers have made a similar statement. Of the twenty-six cases whose parentage I investigated, nineteen were pure English to the third generation, and of these nineteen cases, two were certainly, and three—or possibly four—others were probably Londoners to the third generation. Considering the enormous influx of the country population into London in the last fifty years, and the amount of intermarriage that must take place between the newcomers and the Londoners by birth, the number of children in the above figures, all of whose parents and grandparents were Londoners, does not appear small. It might be argued that there is a great predisposition to chronic intestinal dyspepsia of children in the effete London stock, and certainly, if Cantlie's conclusions are correct, the number of Londoners to the third generation in my cases is very high; without further investigation, however, no definite conclusion can be arrived at.

Family history.—It is unfortunate that, with the time at one's disposal, it was impossible to inquire into each family history with that degree of detail without which information would be of little use. What one would have liked especially to ascertain was whether there was a neurotic taint in the history of the children's forebears. From the few facts obtained, it seems likely that this is so, but not enough information was got to allow of any definite conclusion. A tuberculous history was given in some cases, but probably not in more than one would get in the ordinary community. There were no facts elicited which would show that the disease occurs especially in families with a gouty history.

That the disease affects special families is certain. Three families had two representatives each included in my fifty cases, and in at least three of the other cases another member of the same family had been treated by me for the same disease, though it was present in a less pronounced degree.

This family incidence is almost certainly due to at least two, or possibly all three, of the causes—hereditary predisposition, diet, and improper hygienic surroundings. I have been unable to get cases suitable to supply the answer to the question as to which of these factors is the chief cause of the family incidence of the disease. The answer, however, should not be difficult to arrive at, and, when got, would solve to a great extent the etiology of the malady—it would tell us whether the main factor in causing the disease was hereditary and irremediable, or was due to causes which increased dietetic and hygienic knowledge might remove.

Diathesis.—Amongst the children all types were seen. Several had the pleasing features, the fine complexion, and the long silky hair and eyelashes of the fine tuberculous type; others again had the large teeth and the coloring of the typically rheumatic child. The diathesis was generally masked, to some extent, by the signs of the disease.

School.—It is noticeable that the period of life at which the disease occurs corresponds fairly closely with the period when the child attends school. Some forms of headaches and night-terrors are no doubt exaggerated by school-work, and the misguided efforts of so-called education of the ordinary Board school, by which for many hours every day the child's brain is crammed with undigested facts, whilst his physical education is neglected or ignored, prevent, for many months in the year, a sufficiency of physical exercise from being obtained.

Inattention of the bowels, and consequent constipation, might be an etiological factor. Constipation was not very frequently present in my cases, and even when observed, was more probably a symptom than a cause.

A typical diet is the following:—

7.30 A.M.—Tea, bread and jam, occasionally dripping.
11 A.M.—Bread and butter.
1 P.M.—A little butcher meat, potatoes, bread, currant or suet pudding; water; occasionally milk or tea.
5 P.M.—Tea, bread and jam.
7 P.M.—Bread and butter or jam.

Taking the results as a whole, it may be said that in probably every case the staple of life is white bread; the usual drink is tea, which is generally given at least twice a day. The amount of carbohydrates in the diet far exceeds that of nitrogenous substances and of fats. The four principal carbohydrate foods are—(1) Bread, (2) sugar, (3) potatoes, (4) milk puddings, such as sago and tapioca. A few centuries ago the poorer classes had neither sago, tapioca, sugar, nor potatoes, and their bread was coarse and brown, and so contained much less assimilable starch than does the fine white bread of the present day. Even fifty years ago most of the carbohydrate foods were much dearer, and, consequently, less excessively partaken of.

We thus see that this great preponderance of sugar and starch in the diet is only of comparatively recent date, and it appears highly probable from these grounds that this may be a strong factor in the digestive disturbance. This supposition receives strong confirmation from the beneficial results, in the treatment of these cases, of limiting the ingestion of carbohydrates. Another fact, which strikes one on considering the diet of these children, is the absence of indigestible residue; to this, probably to a great extent, is due the constipation that is occasionally met with.

Bad teeth.—As we shall see, the great majority of the cases have carious teeth, and the septic matter discharged from these may probably, when swallowed, be a cause predisposing to the disease. The rapidity with which, in some cases, the food was eaten, may be a factor in the causation, as well as a symptom of the disease.

Second dentition.—That the disease occurs just at the period of second dentition is suggestive, and this may be of considerable etiological importance.

Sex.—Of the fifty children, thirty-four were boys, and sixteen girls. Though this, perhaps, is a rather larger proportion of boys that really occurs in the disease, there is no doubt that it is commoner in the male sex.

Age.—The age incidence was as follows:—

Age (last birthday)—	3,	4,	5,	6,	7,	8.	9,	10,	11,	12.
Cases...............	3,	4,	6,	7,	7,	10,	4,	3,	4,	2.

From these figures we see that three-fifths of the cases were between the ages of 5 and 8. At Great Ormond Street no children are allowed to attend who are more than 12 years old. From the way in which the cases diminish before the age of 12, however, as well as from experience of the out-patient departments of general hospitals, one may conclude that comparatively few cases occur after that age. As the figures show, it is rare to find cases before the age of 4.

Duration of the Disease and Previous Illnesses.—It was practically impossible to get any very definite information as to the duration of the disease, as its onset is so insidious, and the parents usually stated that it had lasted "for years," or that the child had "never been very strong," and in the majority of cases no definite onset had been noticed. In four cases the disease was said to have begun after measles, and in two it was first noticed after whooping-cough. The small number of cases in which the mothers ascribed the origin to whooping-cough is of interest in view of Eustace Smith's statement[2] that "whooping-cough is, however, of all the diseases the one to which this derangement can most commonly be traced." A considerable number of mothers, however, said that their children had been worse since some exanthema—generally measles, though whooping-cough came next in order of frequency.

Because of the close analogy between chronic intestinal dyspepsia and rickets, it would have been interesting to have found how many of the fifty cases of the former had suffered from the latter disease. Owing, however, to the indefinite demarcation from the normal of the milder forms of rickets, statistics would be of little use. Few of the children showed obvious signs of former rickets. Three of the mothers volunteered the statement that their children had suffered from "consumptive bowels"—i.e., diarrhea and vomiting—in infancy. Four cases were said to have had pneumonia, and one rheumatic fever. In six cases the previous health was said to have been good. In each case the severity of the disease fluctuates greatly from time to time, and after a change of air, or an acute attack of vomiting and diarrhea, the child may appear comparatively well. One finds that there is a distinct seasonal variation in the severity of the symptoms; the patients are generally worse in the early part of the year—January to May.

Before leaving the subject of the etiology of the disease, it will be well to state the conclusions arrived at by other observers. Eustace Smith[2] considers the disease is very frequently the result of whooping-cough, and also of measles. Hutchison[3] lays great stress on the excessive ingestion of carbohydrates. Carr considers the three most important etiological factors to be hereditary digestive weakness, town and indoor life, and improper feeding. Dessau[8] considers the offspring of gouty parents especially liable to the disease. He thinks[9] that over-feeding, as a rule, is the great source and origin of chronic intestinal indigestion in children. This theory can hardly be supported, for it is often in children who eat very little that one sees the best examples of the disease. Goodhart[10] considers the condition "the expression of a constitutional build"—that the patients are the offspring of parents whose nervous systems are feeble or diseased. Donkin[11] also "agrees with Dr. Goodhart in recognizing in them a strong neurotic relationship."

Several of the observers consider that the nervous element is the predominant factor in the disease. Although the good results of dietetic treatment are not in favor of this view, there is much in the etiology and symptomatology to support it. In my opinion it plays a very important rôle in the causation of the malady, and is second in importance only to dietetic errors, more especially to excessive carbohydrate ingestion.

Following close on these in order of importance is, I consider, the excess of brain work and diminished fresh air and physical exercise entailed by the school life of the present day. Measles or whooping-cough frequently exacerbate the condition, but probably are of little etiological importance unless combined with some of the above factors. Other causes which I think exaggerate the conditions are overcrowding, town life, bad teeth, and the second dentition.

SYMPTOMS.—*Languor.*—In every case there was a complaint of languor, though, naturally, its amount varied. Frequently the mothers noticed this as one of the most prominent symptoms, and brought their children, "because they had no life in them"; they "lay about," and could not be got out of bed in the morning. Generally this excessive lassitude is most marked in the morning, and gets less as the day advances. Combined with this is another very constant, and, at first sight, contradictory symptom:—

Excitability.—As many of the others expressed it, their children were "shocking nervous." They cry at the least thing, are afraid—often even in the daytime—to be alone, and jump at the slightest noise. They blush or grow pale at the slightest emotional disturbance. One of the most marked changes as the result of treatment, from the point of view of the child's mother, is the allaying of this excessive excitability. Children, who cried at the slightest word of reproach, will lose this nervousness and become no more easily affected than would a healthy individual. Of the series of fifty children, only one was said not to be nervous or excitable. Another practically constant symptom, and one to which, perhaps, some of the morning languor is due, is—

Nocturnal restlessness.—All except two had more or less disturbed sleep. (The mother of one of these two did not sleep in the same room, and was not very intelligent.) In thirty-eight of the cases, the child would wake up screaming, or had real night-terrors—sitting up in bed, crying with fear, and, although apparently wide awake, for some minutes being quite unconscious of its surroundings or of its mother who tries to pacify it. In thirty-one of the cases it was noted that the child ground his teeth, and the great majority of them talked in their sleep and snored. Five only were sleep-walkers. Six of the children suffered from night sweats. One had day-terrors, similar to night-terrors, but occurring in the day. One boy, who had very severe night-terrors, defecated involuntarily during them. As a rule, it is the early part of the night that the child is very restless; towards morning he generally falls into a deep, lethargic slumber, from which, occasionally, it is difficult to wake him. As we shall find later, a considerable number of the cases had large tonsils or adenoid growths. Contrary to what one might expect, these did not seem to have a very great effect in causing night-terrors.*

Constipation, on the other hand, seemed to have a definite influence on their production in some cases. In eighteen of the children the bowels were regular, and in eighteen there was more or less constipation; of the former, five were without night-terrors; of the latter, only one. Many of the mothers volunteered the statement that their children were much more restless at night when they were attending school, and that when they were kept quiet at home their rest was much less disturbed. This was much more frequently ascribed as a cause than was an excess of their digestive troubles, thus supporting the view of Henoch,[12] Steiner[13], and Wertheimber[14], rather than that of West[15] and Silbermann,[16] namely, that it is to nervous, rather than to digestive influences, that the condition must be ascribed. On the other hand, it does not follow that the digestive disturbance from which these children suffer is not the primary factor—acting by rendering their nervous equilibrium more unstable. That this is very probably the case, is seen from the facts that constipation has a distinct influence in causing the condition, and that merely by dietetic means, by diminishing the amount of the carbohydrates, the sleep of those children can frequently be rendered more placid and refreshing.

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* "Night-terror" is used here in the widest sense of the term, and includes cases not only of true nocturnus, but also those cases in which the child wakes up screaming or crying from fear, but quite realizing his surroundings.

Atkinson[17] considers that night-terrors are associated with enuresis, which he says is the result of the fright. tI was not often that the two symptoms occurred simultaneously, though the number of children who had enuresis and also had night-terrors was slightly larger than calculation would warrant.

Though not one of the most prominent symptoms, enuresis falls naturally here for consideration. Thirty children did not wet the bed, two had formerly done so, six wetted it rarely or ocasionally, and six did so frequently. In relation to their numbers, the proportion of boys and girls was practically equal—ten boys and four girls. Several children found it difficult to hold their water for any length of time during the day. The sex incidence would tend to show that phimosis had not much influence in causing these cases of enuresis.

Enuresis has been frequently ascribed to the presence of worms, and to enlarged tonsils or adenoids. The present statistics show that only the proportion of children one would mathecatically expect who suffered from enuresis also had intestinal worms. On the other hand, eleven of the fourteen children who had enuresis had also enlarged tonsils or adenoids. This figure seems to be beyond the chance of incidental error, for the number should be only 7.5.

The next and very important symptom to be considered is—

Headache.—Forty-seven of the fifty cases suffered more or less from headache. Two of the three children between 3 and 4 years old did not complain of it, the other child who was without this symptom was aged 6. In several other cases not included in these statistics, it has been noticed that it is comparatively common for the youngest children suffering from the diseases to make no complaint of this symptom. In forty-four of the forty-seven cases in which headache was complained of, it was felt in the frontal region. In one of the remaining cases it was confined to the left frontal region, in another to the temporal areas, and in the third to the right vertex. In thirteen of the cases it occurred at no special time, in eighteen it generally came on in the morning, in nine it occurred most frequently after school and in one it occurred either in the morning or after school. Three children had it most frequently in the evening, and in the remaining three cases it occurred only when the child had "bilious attacks"—exacerbations of the disease which shall be described later. It is unfortunate that time did not permit of the examination of the eyes in every case. A certain proportion of the cases were tested,—unluckily the exact numbers have not been kept,—and of these six had errors of refraction, two had hypermetropia, one astigmatism, two hypermetropia and astigmatism, and one had myopia. In three of these six cases the headache came on after school, in another it appeared in the evening. The two other children in whom the headache came on in the evening were two of the three cases in whom the headache was not frontal in character—one had headache in the temporal region and the other in the left frontal region. The child who had right vertical headache had a discharge from the right ear. Eight of the nine cases in whom the headaches came on, especially after school, were between the ages of 6 and 8—just the age when children begin to have steady hard work in their classes. Neither night-terrors, enlarged tonsils and adenoids, nor constipation appear to be the cause of the headache which occurs when the child awakes.

Cough.—Forty-eight of the children had a cough, though it was generally slight, and frequently was described as merely a "hacking," and was little more than the clearing of the throat. Sometimes, however, it was said to be "barking"—the typical "stomach cough." At the time of examination, in only one case was there any bronchitis, though in a considerable number, on auscultation, one heard an occasional rhonchus, especially on deep inspiration.

From the fact that practically all the children had cough, it would appear that enlarged tonsils or adenoids had little to do with its causation. Even when there were no large tonsils or adenoids, the pharynx was generally more or less congested, however, and it was to this cause probably that the cough in the great majority of cases was due.

Epigastric pain.—Forty-seven of the children suffered from attacks of pain in the epigastrium or right or left hypochondrium. It generally came on at no special time, in only four cases did it appear after food. Occasionally the child would wake crying with it during the night, and in some instances it was most frequent in the morning. In several cases it was said to be "just under the heart," and the mothers occasionally feared that it originated in that organ. It was frequently so severe that it caused the child to come home from school.

From the fact that the pain had generally no relation to food, and that it was frequently felt in the right or left hypochondrium, it seems likely that it originates, as Henoch[12] says, not in the stomach but in the large intestine. There was no apparent relationship between this symptom and the presence or absence of mucus in the stools, and it occurred as frequently in cases where the bowels were regular or where there was diarrhea, as where there was constipation. This observation is quite contrary to the statement made in most of the text-books on children's diseases,—namely, that colic is generally the result of fecal accumulation.

On inquiry it was found that many of the cases were very prone to have a "stitch in the side." This pain is of a different nature to the epigastric pain just described, and occurs only after exertion.

Pains in other parts of the body.—Two children complained of pains in the legs, and one of pain in the left knee. One child had slight lumbago, and one was suffering from a mild attack of "stiff neck." In no case were rheumatic nodules observed. One boy complained of numbness of the hands.

Wasting.—In every instance, without exception, the mother said her child was growing thinner. In those cases in which the illness had lasted "off and on" for years, during the remissions the child would gain a little weight, only quickly to lose it again when it had a relapse. This symptom will be further discussed when we proceed to consider the physical examination.

Appetite.—In the great majority of cases the appetite was deranged; in only four cases was it said to be ravenous. In twenty-four it was always poor, in nine always ravenous. The other cases alternated between these two extremes. There was a distinct relationship between the sex of the child and the character of the appetite. In all the female children, with the exception of two, the appetite was persistently poor. No connection seemed to exist between the amount eaten and the frequency of defecation, or the presence or absence of worms. An excess of mucus, as we shall see later, was noticed in the stools of some of the patients. When this excess was present, the appetite was generally poor. As it is known that sugar increases the amount of mucus secreted, and as it appears probable that one of the factors in the causation of chronic intestinal dyspepsia is an excessive ingestion of carbohydrates, the mothers of the patients were interrogated as to the amount of sugar and sweets their children ate. About half of the cases were stated to take a large quantity, but no relationship can be traced between the taking of an excess of sweets and any of the signs or symptoms of the disease under consideration. It must not be forgotten that even those children who take no sweets may, nevertheless, eat an excessive amount of carbohydrates, as by far the greater proportion of carbohydrates ingested is taken in the form of starch. The rapidity with which the children ate their food seemed to depend almost entirely on the character of their appetite. Whilst those with ravenous hunger would bolt their food, the others who had poor appetites did not seem to eat too quickly.

(*To be continued*)

HEMORRHAGIC TYPHOID IN A CHILD; RECOVERY

By Marion McH. Hull, M.D.,

ATLANTA, GA.

No subject is of more interest to the practitioner of medicine than that of typhoid fever, so universal is it in its distribution over the country and so impartial in its choice of its victims. While formerly considered a disease of youth and adolescence, it has been observed in old age, and recent years have demonstrated the fact that there are a great many children who are attacked by the bacillus of Eberth, the youngest case reported being but four and one-half months of age.

It is also of interest because of the various forms that the disease assumes in different individuals, giving us the abominal type, the pneumonia type, the neurotic type, etc. Recently there came under my care a child that was suffering from a rather rare type of the affection, a history of whose case I desire to make a record both on account of the rarity of the type, and also on account of the unusual termination of the disease. The case is as follows:

J. V. D., Jr., male, four years old, the youngest child of a large family, previously in the best of health; surroundings healthful. Family history good.

On March 16 the patient was taken ill with a severe headache and abdominal pain, followed by fever and stupor. He was given some medicine to act on his liver, and on March 20, when I saw him first in the late evening, his condition was as follows: Temperature, 104°; pulse 140; respiration 24. Patient was more or less stupid, tongue was furred, dry and brown; breath fetid; chest normal; bowels had moved that day and the stools were liquid and of foul odor. There was no abdominal tenderness; no tympanites; no gurgling. Diagnosis was withheld, and he was put on liquid peptonoids, and a prescription containing calomel, salol and guaiacol carbonate.

March 21.—Temperature 102°; pulse 130; respiration normal (as they were throughout). His condition had not changed. He had passed two bloody stools, without any straining, and contained no mucus. His nose had bled during the night. In the evening of the same day the temperature was 103.5°, the tongue was black and dry; there were sordes on the teeth. There was still no tenderness, nor any tympany. The provisional diagnosis of typhoid fever was confirmed.

March 22.—No change in his condition. Turpentine in emulsion was ordered to be given every four hours, five drops at a dose.

March 23.—Patient had been very delirious since the last visit. Bowels had moved several times, but stools are of the same character. Temperature by axilla was 101.5°. Pulse weak. Ice helmet applied, and whiskey ordered. P.M.: Condition the same, except that the delirium was not quite so marked.

March 24.—Temperature 99.5°; pulse 128, better volume. There were hemorrhage spots all over the body and limbs; the gums were bleeding; the nose had bled several times in small quantities; there had been several tarry stools. The urine was highly colored, but an examination on the 25th showed no albumin, no casts, no sugar, sp. gr. 1008. In the evening the temperature was 100.5° by axilla; pulse 128. There was a conjunctival hemorrhage, involving all of the inner canthus of the right eye, and two small ones in that of the left eye.

March 25.—Temperature 98; pulse 128. Petechiae were fading; two small tarry stools. Ecchymoses everywhere that the patient was handled in turning him over; also on the parts of his body that were pressed upon by the bed. The stupor had disappeared, as had the delirium. There was great languor. Evening temperature 100°; pulse 128. There was decided hematurian.

March 26.—From this time until the 31st there were several tarry stools daily, a great deal of blood in the urine, a good deal of gas in the stools. The turpentine was discontinued and adrenalin (1-1000) was given in doses of five drops, every three hours, by mouth. In two days this was increased to ten drops every three hours. The temperature continued normal in the morning, and from 99° to 99.5° in the afternoon. The pulse varied between 128 and 136. The tongue began to get moist and to clear off on the 26th. On the 27th the patient complained of hunger. On the 28th broths were added to the dietary. On the 29th the urine was very scanty, but increased to normal after the administration of lithia water freely. On the 30th there was no blood in the stools, and they were well formed. On the 31st the urine had cleared up, and the adrenalin was discontinued. The ecchymotic spots and the conjunctival hemorrhages were gradually absorbed, and the patient made an uneventful recovery.

There are a number of things about the case that deserve to be emphasized, and a number of others that are quite characteristic of the type of typhoid that occurs in children. Let us look at these first. They are the rapid rise of temperature instead of the gradual rise, as in adults; the absence of prodromes; the shorter duration; and the increased manifestation of the nervous symptoms. All of these are shown in this case.

But the particular characteristic of the present case was the occurrence of hemorrhages in all parts of the body. Here on the fifth day of the disease there occurred two hemorrhages from the intestinal mucous membrane, which continued every day thereafter until the fourteenth day, being quite profuse most of the time. Epistaxis occurred on the fifth and on the eighth day. Hemorrhages from the mucous membranes of the mouth and into the skin began on the eighth day and continued until the fourteenth day. The conjunctival hemorrhages occurred on the eighth day, and the hematuria was first seen on the ninth day, continuing until the fifteenth.

The temperature was peculiar. Ranging from 102° to 104° until the eighth day, it then fell to 99.5°, and varied from that to normal during the second week, the fall being simultaneous with the occurrence of the hemorrhages into the skin and mucous membranes. The pulse was good, although at times it was weaker than at others.

An examination of the blood was made on the tenth day for the plasmodium, but was found to be negative. No count of the corpuscles was made, I regret to say. The corpuscles were crenated; otherwise there were no abnormalities in their microscopical appearances. The Widal test was not made.

In looking over the literature of the subject, there are very few references made to this variety of the disease at all. In fact, none of the recent textbooks on pediatrics that I have consulted refer to this affection at all. All of them mention, of course, that intestinal hemorrhage occurs in the typhoid of children, but only in a very small proportion of these cases (3 per cent., according to Holt). This variety, however, is quite rare. In the epidemic at Basle there were noted only three cases in 1900; only one has occurred at the Johns Hopkins in a series of 829 cases. Curschmann has seen but six cases. Various other observers have reported cases of renal hemorrhage in typhoid (see bibliography below); Gillette a case of hematemesis; Powell a case of hemoptysis; Blyumenau a case of hemorrhage into the larnyx; Koenig a case of profuse hemorrhage into the mucous surfaces, and Barlow a case of purpura, occurring in the course of typhoid. But the case of Koenig's seems to be the only one that could be classed with this variety. This is the only case that the writer has ever seen.

There is a good deal of doubt as to the cause of this affection. It has been assigned to overcrowding, to deficient nourishment, to scorbutic states, to alcoholism, and to the predisposition of youth and adolescence. The latter could have been the only etiologic factor in the present case. Trousseau thought that it was due to an altered state of the blood, in which the coagulability was deficient. Osler found that in the case at the Johns Hopkins above referred to the coagulation time of the blood was increased from four to ten minutes, during the time when the hemorrhages were occurring. The subject needs further study.

The results have been very unsatisfactory in treating the condition heretofore. All of Curschmann's cases died; the case that is reported from the Johns Hopkins recovered; Wagner's mortality was 66 per cent. All hemorrhages in the typhoid of children are very dangerous, the mortality varying from 20 to 50 per cent., according to different observers. We would naturally expect that this variety would be much more dangerous to these little patients therefore. From the happy result obtained in the present case, we are led to hope that in the new hemostatic, adrenalin, we may have found a remedy that will control the tendency to hemorrhage, and thus conserve the strength of the patients until they can overcome the attacks of the enemy.

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CHILDREN'S DISEASES IN CHINA*

By Mary V. Glenton, M.D.,[1]

WU-CHANG, CHINA.

I spent the best part of my first two years in China finding out that the same diseases do not manifest themselves in the same way as they do at home, either in children or adults, and that the treatment that worked like a charm at home fails utterly here, while the treatment that we scarcely ever resorted to there will usually prove most efficacious here; and last, but not least, I found that we meet with and see things that we would never see at home, and to which is only given a very short space in the text-books used in the home colleges, and an equally short time in the lectures, with no clinical material. My first two years were spent in grasping the fundamentals of practice and therapeutics in China.

The safest division is, to my mind, surgical and medical, although one merges into the other to such an extent that the dividing line is hard to draw.

In the surgical cases we are all familiar with the child brought to us in the advanced stages of hip disease, sinuses galore in the region of the joint, the ankylosed knee, and the atrophied and shortened leg; the mother blandly tells us with her most condescending manner that we may take the child into the hospital if we promise to send him out cured at the end of ten days; another brings a child with a decided hump, the result of Pott's disease; you may take him in, as a very great favor, for three days, but he is to be returned perfectly well at the end of that time. Some more parents of the same order will bring a child suffering from cancrum oris or noma, the whole side of the face one great black dry mass of necrosed tissue; they will tell you, with every notion that you will believe them, that this state of things has lasted four

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[1] Dr. Mary V. Glenton was formerly Superintendent of the Home Hospital, LaFayette, Ind., and practiced her profession therein about three years.

days, and won't you please give them some medicine to drink that will make the child well? In all these cases you go into elaborate details as to what should and should not, could and could not be done, exhausting your own stock of Chinese and that of every one within reach at the time. The mother picks up the child with a dissatisfied grunt and walks off; at the next medical meeting you find that they have called on your neighbor in another mission hospital, and you are not at all surprised to see the same case bob up serenely at a clinical meeting across the river, and not a bit abashed at seeing you there. You wonder what there was in your neighbor's method that succeeded where yours failed. The question answers itself by your discovering that some patient is now under your charge that had gone the rounds, but this time you happened to be last instead of the first to whom the patient was presented.

When I first began to work in Wu-chang I was deeply impressed, and I am still, with the way in which serious cases of various kinds yield to patient care and treatment. I have had women and children come to the clinic with feet that cannot be described in any other way than inflamed or diseased or even putrid masses of flesh, all semblance to a human foot gone, the inflammation extending in most instances up to the knee. I have put the patient to bed, dressed and irrigated the foot twice daily, given quinine internally, and the patient has come out, with one exception, with a fairly good foot, and in the exceptional case the bones of two toes were exposed and the father refused amputation, as Chinese fathers usually do. Just about this time of year such feet as I have described come in frequently, and they all tell the same story—a scratch or abrasion on the foot, daily working in the rice fields. The negroes of the South work in the rice fields at home in their bare feet, too, and we never meet with this state of things; the water here may be dirtier, but the negro of the South will get lock-jaw on the slightest provocation. To such an extent is this true that some of our American text-books read in the etiology of tetanus: Sex, males more frequent; race, negro greater prevalency. I have formed this opinion, and I may ask some one of longer experience to correct it if it be wrong; that the bound foot and its atrophied muscles, misplaced bones and retarded circulation hasn't the power to throw off the poison carried to an abrasion, and, however slight the abrasion, the continued action of the dirty water and the lessened power of resistance in the tissues attacked bring about this state of things.

Then there are scalp abscesses that are so frequent here, and, as far as my experience goes as nurse and physician, at home they are rare as they are frequent here. Why this is so I cannot explain, and again I ask for light. The Chinese are a dirty race, but their hair and heads are much cleaner and even freer from pediculi in the coolie class than are our tenement people at home. I can only lay these abscesses to the door of infected razors, but why don't our workingmen at home develop them on the chin? Italians are not the cleanest people on earth, and in our slum districts at home, in New York at least, the Italians have the monopoly of the barber trade.

It is needless to go into the cases of dactylitis, suppurating cervical glands, and chronic abscesses generally; these we see at home, possibly as frequently, but rarely in such advanced stages and neglected condition. To pass on, as I said before, the medical and surgical merge the one into the other, as, for instance, the mucous patches that need surgical dressing, the otorrhea that takes as much time as would a satisfactory abscess; these cases have to be treated under both heads, and not always with results either speedy or satisfying.

I have had a great many cases of prolapsed rectum among children; they all come at the same time of the year, *i.e.,* at the close of the summer vacation. I sometimes have found the protruded bowel covered with thin Chinese paper which has hardened and formed a crust, but which comes off in scraps; getting this off usually gives the child a good start in the crying process, so that when I am ready to reduce the prolapsed bowel the child is screaming, bearing down, kicking, and resisting in every way possible. I have succeeded in reducing the prolapse in all cases but one; that case came to the dispensary across the city; the child was cachetic when I first saw it, and each time it came the bowel was farther out than the last. I think I saw the child four times; the first three I reduced the prolapse, but the last I simply could not. I am afraid to say how long the prolapsed portion was; it looked like yards to me. Another very stubborn case was conquered by strapping the buttocks.

One cause for this condition is, to my mind, the position assumed in defecation. At the end of the long summer, with its train of intestinal disorders, the weakened bowel can stand very little strain, the buttocks have no support ordinarily when a child moves its bowels, there may be tenesmus, and even without, prolapse follows. We have to guard against it at home in some children.

The intestinal disorders seem to belong to about the same order as they do at home, with possibly less cholera infantum and more dysentery. The children seem to come through the summer and its disorders better than do the little folks at home, in America at least, and at home even the very poorest have a better chance for life, with the help of the district physicians, district nurses and floating hospitals, etc., while here injudicious feeding, dirt and neglect all help on the disease.

Speaking of intestinal disorders brings me to intestinal parasites. It is the rule of the mission hospital in Shanghai (or it was when I was there) to give santonin and calomel to each patient on the night of admission. I have not only adopted it as a rule here, but I find it a good plan to follow a similar rule with the children in dispensary practice.

I had one child come in a year ago for tubercular glands. Her bowels refused to act after the initial dose (I gave santonin, calomel), followed by salts and castor oil galore, even resorting to a drop of croton oil on the tongue; the bowels still refused to act, and my helper, who was untrained, reported failure after two enemata. I was very busy, and it wasn't till late in the afternoon of the second day of dosing that I could find time to give an enema myself. I finally managed it, however, gave it very slowly and with intervals of rest, and to my extreme gratification (for I thought I had an obstruction) I succeeded in getting the bowels to move. A mass of squirming worms came away, over a hundred; the child was relieved from pain immediately and slept soundly. For about four days she kept passing these things, about twenty each day. I gave her santonin once a week regularly, and every week the same result—worms for three days. She left at the end of six weeks, or I should be dosing her yet, and possibly with the same result. You are all familiar with the enlarged abdomen of enlargement of the spleen, and you have all been called at some time to children in convulsions, who have been that way for six or eight days, and who would promptly go into another at the slightest touch. Some of these cases, in my experience, have recovered; in others I have never heard the result; and still others have improved, but in a day or two have fallen back under Chinese treatment.

I went through an epidemic of cerebro-spinal meningitis in Shanghai. I was called to several cases, but only knew the final result in one, and she was in the mission family; she recovered.

The disease, or symptom rather, that baffles me most is the ever-present dropsy in the slave girls. Will somebody tell me what to do for it? I find albumin and I give diuretics and heart tonics, for the heart is generally all out of order. I tap and the child fills up again in less than a week, and after that I get to where I can't tap any more. I have given steam baths and put the child to bed; the face then swells to an enormous size, being more swollen on the side on which the child lies longest; she gets up, and her face goes down. In one or two cases, when I have gotten hold of the child in time, I have sent her away improved, but in the majority of cases the child has been taken home to die, or left in the hospital to do the same thing.

I have seen very little pneumonia; in fact, practically none amongst the children here. I have had cases of capillary bronchitis, and it was in connection with this disease that I found out what a large dose of ipecac it takes to get an emetic effect on a Chinese child.

The exanthemata seem to attack Chinese children in a milder form here than at home, except possibly scarlet fever. I had a case in Shanghai that was not fatal in itself, but it caused great mortality nevertheless. An in-patient, a child, caught scarlet fever; she had found her way into the waiting-room during dispensary hours, and a case of scarlet fever was there waiting to be seen. The child was promptly isolated, but her father was informed of her condition; he came to see her, bringing with him her brother; after they had gone I found, to my horror, that the boy was a St. John's College boy. The boy was sent home before he had a chance to spread the disease through the college, and the father took the girl home to Kia-ding. She went from the hospital to the boat in a public rickshaw and from Shanghai to

Kia-ding in a public boat. The child recovered, but there were twelve deaths in the alley in which the family lived, and all the sickness dated from the child's arrival.

Speaking af Shanghai calls to mind cases that should have been brought in under the head of surgical cases. I had at one time, while I was there, seven children, babies all of them, coming for daily dressing with poisoned arms, the result of vaccination in their native city. One child had a slough shaped exactly like a clover leaf, but about three times as large as the largest clover leaf that I have ever seen. When the slough was removed there was a three-leaved hole extending down to the periosteum. This soon healed up, as did all the other cases with one exception. Amputation seemed the only hope in the exceptional case, but when I told the mother she acted like the ship they sing about. She never came back.

Skin diseases in children are about as they are in adults, running chiefly to scabies and eczema, with psoriasis for variety and the ever-present tinea of the scalp. Then we have the malaria fevers, typhoid and beri-beri, but these are not, strictly speaking, children's diseases, and any way I have seen only one case of beri-beri, and that was in Shanghai.

THE DIAGNOSIS OF CEREBRO-SPINAL FEVER

By Max Mailhouse, M. D.,

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The question of diagnosis is not an important one during the presence of an epidemic, in typical cases. Here a sudden onset with headache and vomiting followed by more or less elevation of temperature, rigidity of and pain in the neck muscles and accompanying delirium, make up a clinical picture which is sufficiently characteristic, especially when the condition soon advances to one of stupor together with hyperaesthesia of skin and deep tissues, opisthotonus, palsies of cranial nerves and of one or more limbs.

The cases of rapid course and the early individual cases of the epidemic, or the sporadic cases and also the cases of other diseases which in particular instances and at certain times may resemble cerebro-spinal fever are the ones which bring the question of diagnosis into prominence. The mild ambulant cases might scarcely be recognized at any other time than during an epidemic as they may speedily pass over into health from a history of headache, nausea, uncomfortable sensation in the back and limbs and some stiffness in the neck, with possibly slight fever. Rheumatism in the neck muscles in children as also acute otitis media may exhibit or be accomplished by such a train of symptoms.

Cerebro-spinal fever I prefer to call it in preference to spotted fever, for it is not more spotted than typhoid and in many instances much less so, and certainly less characteristically so.

In many cases the fact of there being a meningitis, cerebral or spinal or both, is recognized by the attendant but the question arises in his mind, Has he a case of the epidemic form to treat? To solve this problem of course the presence of other cases in the community either recently or within a year or two must be taken into consideration. In this type, also, the retraction of the head appears early, as also the rigidity and pain on attempted movements of the limbs. This is also soon followed by general rigidity, which is so pronounced that a single limb may often be moved in toto. The reflex irritability is great and the superficial reflexes are very active. The tâche cérébrale appears early and is common.

An early, and hence very important, diagnostic evidence, is the edge of the bed, with legs dependent, the thighs being at a Kernig's sign. This may be obtained by seating the patient on right angle to the body, when an attempt to bring the legs on a straight line with the thighs produces severe pain and becomes impossible. This symptom I have often brought out with the patient on his back when on flexing the thigh on the trunk to an angle of ninety degrees and an attempt is made to extend the leg on the thigh the same difficulty is encountered. This symptom is due to meningitis in the lumbar and sacral regions producing irritation of the motor and sensory roots and hence great reflex irritability together with pain from stretching.

Another sign of equal importance is obtained from lumbar puncture and the examination of the fluid drawn. If the characteristic diplococcus intracellularis is found the diagnosis is established. I have not yet been able to get the germ, although the fluid is frequently obtainable. Sometimes, however, even no fluid is found, though the needle is certainly within the spinal canal.

The modus operandi is simple. The needle and back of patient having been rendered sterile a line drawn through the upper iliac borders will cross the span btween the third and fourth lumbar spines. This space is preferred in children but the one next above for adults. Next the spine should be *strongly* flexed upon the pelvis, and the needle introduced just to one side of the median line, slightly cephalad and toward the median line for a distance of about one and one-half inch. This will vary according to the amount of muscular and adipose tissue and age, whether child or adult. A feeling as if resistance were suddenly removed tells one that the spinal canal has been entered. Elevating the shoulders aids the flow. About 4 c.c. may be removed with safety, and in the last stages, when symptoms of compression are present, more may be removed with advantage, and as a therapeutic measure.

A pupillary phenomenon recently described may be of considerable assistance in the making of a diagnosis. It has been described as a dilation of the pupils on forcible flexion of the head on the chest and a contraction on bringing the head back again. I have observed it in two or three cases. Its explanation appears to me to be similar to that of Kernig's sign and caused by the meningitis involving the lower cervical roots. These supply the sympathetic system with the dilators of the pupils; and we know that irritation of the neck, by pinching the skin or by the faradic brush, produces dilation. Now forcible flexion irritates these nerve roots by stretching their inflamed meningeal covering and thus the dilation is brought about.

Another characteristic symptom is the Herpes. This is marked and extensive and though usually confined to one or both lips, may also appear on other parts of the face. Other eruptive phenomena are frequently present but seldom come on until after the third day. The most common is a diffuse petechial eruption, usually on the extremities. The eruption may be erythematous or urticarial. Pemphigus may appear; a purpuric rash is rather characteristic. The onset may be accompanied by severe nasal catarrh, as described in the reports of some epidemics though I have seen none such. This might lead one to think it a case of epidemic influenza and when both epidemics are contemporaneous the distinction becomes important. Here the disassociation of pulse and temperature becomes an important phenomenon, the former, as a rule, being comparatively low in the epidemic affection under consideration.

Probably the diagnosis from tubercular meningitis must be more frequently made than from any other affection. The following points in the diagnosis should be noted:

	EPIDEMIC FORM	TUBERCULAR FORM
Onset,	Sudden,	More insidious.
Coma,	Comparatively early,	Rather late.
Spinal Symptoms,	Symptoms prominent,	Inconspicuous.
Retraction of head,	Early symptoms and rigidity,	Seldom seen.
Course,	Runs at times a rapid or acute course,	As a rule runs a more protracted course.
Skin Eruptions,	In more than half the cases; Herpes, petechial,	Rare and not herpetic or petechial.
Lumbar Puncture,	Diplococcus intracellularis,	Tubercle bacilli.
Kernig's sign,	More likely and early owing to spinal involvement,	Late if at all.
General hyperaesthesia of skin,	Prominent,	Not prominent.

Cranial nerve palsies,	In protracted cases,	More commonly has *palsies of ocular* and peripheral muscles, hemiplegia and aphasia. *Tuberculosis* of other organs.
Optic neuritis,	Not uncommon after four or five days,	Occurs late if at all.
Pulse ratio,	To temperature often less than normal,	
	Deafness,	*Grinding of teeth.* *Hydrocephalic cry.* *Tubercles in choroid* as late symptoms.

With regard to other affections which during an epidemic might erroneously be considered examples of this disease:

(1) Typhoid fever is rather characterized by its slow development, characteristic chart *(i.e.,* lower in morning than evening, while in cerebro-spinal fever it may be lower in the evening or more or less constant), tympanites and distended abdomen, rose spots and eruption by preference on chest and abdomen, and Widal reaction. In those cases of typhoid which begin with symptoms of cerebro-spinal irritation, the meningeal symptoms and headache in particular subside as the disease progresses; there is an absence of herpes and no rigidity of abdominal and spinal muscles and muscles of extremities. Kernig's sign does not appear and lumbar puncture gives no characteristic coccus. I once treated a sporadic case in which early rigidity of the neck muscles together with headache and stupor led me to diagnose cerebro-spinal meningitis. An amelioration of the symptoms caused me to doubt the diagnosis and consider the probability of its being typhoid. However, the later absence of Widal reaction, the presence of Kernig's sign, the later appearance of herpes and the progress of the case confirmed the original diagnosis.

(2) That anemic pneumonia may simulate the disease under discussion is evidenced by a case recently seen in consultation. The boy, aged twelve, was seized with headache and vomited in the evening (after a purgative). The next day convulsions set in, at first tonic and then some clonic convulsions. When seen by me he was in a stupor with more or less rigidity and more marked on one side of the body than on the other. The elevated temperature may have been the result of the convulsive movements. The pupils, which were very small, were no doubt affected by the

morphine—one-half grain given to arrest spasm. This case, occurring during the prevalence of other cases reported, looked very like to one of that class. Kernig's sign was absent, however, and an examination of the urine drawn by catheter revealed a decidedly smoky color and considerable albumen. Investigation developed the fact that the patient had a sore throat two weeks previously and a history of diphtheria when an infant. Although the presence of vomiting, convulsion, marked and general rigidity, point toward cerebro-spinal fever, the absence of herpes, hyperaesthesia, Kernig's sign, and the presence of albumen and tube casts, should clear up the diagnosis.

(3) Smallpox has simulated cerebro-spinal meningitis and failed of an early investigation by experts, but the continued absence of muscular rigidity and pains in the neck and spinal muscles and absence of palsies and Kernig's sign, should suffice to exclude it. Poliomyelitis may occur in epidemic form, and should be thought of in typical cases.

I have seen intermittent fever in a child of eight, with herpes on lips and crying, "Oh! my head, my head!" which might have been called, during an epidemic, cerebro-spinal meningitis.

At this season of the year malarial affections are also prevalent and error should be guarded against.

Tetanus may be and, indeed, has been, confounded with this disease, as has also alcoholic delirium.

SOCIETY PROCEEDINGS

NEW YORK ACADEMY OF MEDICINE

Section on Pediatrics.

Stated Meeting, Held October 13, 1904.

Dr. David Bovaird, Jr., in the Chair.

Sclerema Neonatorum.—This case, presented by Dr. Sara Welt-Kakels, was a boy aged seven and one-half weeks. He had been brought to the Mount Sinai Dispensary about the middle of September, when his history was given as follows: The father had been troubled with a stomach affection for some fourteen years, but had worked at his trade of painting, and the mother was healthy. The patient was one of seven children, three of whom had died in infancy from lung trouble, the remaining three being healthy. There had been one miscarriage five years before. For three months before patient's birth the mother had not felt well, her feet were swollen and she moved about with difficulty. Her confinement lasted thirty-six hours and the delivery was instrumental, the child being asphyxiated, and not crying for forty-five minutes. It had a tumor on its neck, was restless and cried if handled. It was breast fed; it vomited much and was somewhat constipated. Two days before bringing the child to the dispensary the mother noticed that the skin of the neck and upper arm was hardened. Upon examination the skin was found to be indurated upon the whole of the back, on the shoulders, sides of the chest and front of both femurs. Coextensive with this induration was a reddish brown discoloration of the skin, which was inelastic. Pressure did not produce pitting. The joints were movable, thoracic and abdominal organs normal. On the right side of the neck a tumor, somewhat tense to touch and movable, was found. No pain resulted from pressure. The tumor was probably embryonic in origin, due to cystic dilatation of a bronchial fissure obliterated at both ends. Dr. Welt-Kakels said that sclerema neonatorum is most observed in children whose heart action is weak, or who are asphyxiated and premature. The patient in question was born at full term, however. Bad hygienic surroundings favored the occurrence of the disease, and it frequently occurred in foundling homes. It is not common in America. One noteworthy feature of the present case was that, whereas a subnormal temperature is ordinarily reported, this patient's temperature, when first observed, was 101° F. He was under treatment, chiefly by hot baths, and seemed to be improving.

Dr. W. P. Northrup said that his experience included only one case of scleredema of the new-born, seen many years since at the New York Foundling Asylum. This case resulted fatally. The temperature was lower than any obtainable thermometer could register, and the hardening of the skin spread from the cheeks over the neck, shoulders, and finally the entire body, the child becoming cold and stiff. Every possible application of artificial heat failed to raise the body temperature in the slightest degree. Microscopic examination of tissue from various parts of the body after death gave only negative results.

FIRST AND SECOND DENTITION PERIODS: INFLUENCE ON EPILEPSY.—This subject was discussed in a paper by Dr. W. P. Spratling, Superintendent of the Craig Colony for Epileptics, Sonyea, N. Y. He believed that the convulsions of infancy should never be regarded as harmless. Although many of them both began and ended as benign, many others beginning so ended in established epilepsy. A study of the etiology of the disease in some 2000 cases, extending over ten years' experience at Craig Colony, had established this conviction in his mind. The fact that convulsions appearing in conjunction with the dentition periods frequently disappeared entirely for a long space of time does not warrant any security that they will not reappear whenever some time of physiological stress arrives, as the epoch of puberty. The convulsive tendency in the child has been evidenced, and should be recognized, as keeping him from convulsions decreases the danger of later epilepsy.

Dr. Spratling also presented several charts, giving statistics compiled at Craig Colony. The first chart showed the age, in years, at which epilepsy had developed in 1215 cases. These statistics were made up to the twentieth year, and included 80 per cent. of all patients admitted at Sonyea up to the time when the figures were compiled. In more than 14 per cent. of these cases epilepsy occurred in the first year. After that the percentage lessened up to the end of the fifth year, which included only about one-fifth as many as the first year. Through the next three years, corresponding to the second dentition period, there was a marked rise in the percentage, and following that period the number again dropped.

The second chart similarly compared the months of the first year, with the result that a marked rise was evident corresponding with the beginning of the first dentition period.

The third chart, compiled from 3523 cases which had developed epilepsy before the twentieth year, showed 376 in the first year, these being due in the opinion of the author to congenital causes, heredity, accidents at birth, and the first dentition. The percentage then decreased until the end of the seventh year, increased through the eighth, fluctuated through the ninth, tenth and eleventh, and again began to increase with the occurrence of the period of puberty, 877 of the cases noted occurring within the four years of this epoch. After this the number rapidly decreased, and less than one-fifth of all cases of epilepsy develop after the twentieth year.

Dr. A. Jacobi agreed with Dr. Spratling that the frequent convulsions of infancy should be looked upon as serious. He preferred, however, not to emphasize the idea that the convulsions leading to epilepsy were dentition convulsions, but to refer to them as convulsions which occur for various causes during dentition. Teething really begins very early in the life of the fetus, and the teeth are already fully developed in the gums at birth. They usually appear at about the seventh or eighth month, sometimes earlier, sometimes much later. The latter occurrence is not due to the teeth themselves but to the child's general condition, which is also the basis of the convulsions, as in rachitic children, where convulsions are not due to teething but to the abnormal condition of the meninges of the brain. A normal child would not be expected to have convulsions during the dentition period. The occurrence of so many convulsions during the first year of life was curious, since the reflex activity of the new-born was almost entirely lacking. At that time the convulsions were of cerebral instead of reflex origin, and often due to hemorrhages, which are not uncommon in the new-born, owing to the friable nature of their blood vessels. Mild sepsis might also be a cause. Epilepsy and paralysis might result from premature ossification of the sutures of the bones of the skull. Dr. Spratling, while emphasizing dentition in the causation of epilepsy, had not mentioned such important factors as improper diet, etc. Dr. Jacobi had lately seen a child suffering from convulsions who was teething, to be sure, but had also been given frankfurters and sauerkraut to eat. One convulsion from any cause might produce hemiplegia and epilepsy. Most of Dr. Spratling's cases were the children of drunkards, in some instances both parents being drunkards and not infrequently the ancestors for several generations. Each case should be judged upon its own history. Teething could not be looked upon as generally or even frequently the cause. The normal child does not suffer in teething except possibly from a slight salivation or diarrhea. Local changes of the brain were the cause of most cases of the epilepsy developing in childhood.

Dr. Charles G. Kerley agreed with Dr. Jacobi, and further noted that Dr. Spratling's charts showed a marked decrease of cases developing in the second year notwithstanding that this is the most difficult portion of the first dentition period when the canines and molars appear.

Dr. Floyd M. Crandall said that two questions were suggested by the paper, namely, whether dentition produced convulsions or not, and also whether these early convulsions developed into true epilepsy. Personally he could not believe that convulsions could result from teething in a healthy child. In children suffering from rickets, bad digestion, bad heredity, etc., dentition might prove the straw that broke the camel's back, and convulsions appear at the dentition period. He agreed that the convulsions of infancy should never be considered benign, and children who showed that tendency should be carefully guarded from everything that might aggravate it.

Dr. Spratling, in closing, remarked that he had not attempted to prove the influence of dentition upon the development of epilepsy, but merely to present facts and figures. Many other factors were doubtless operative in the cases he reported. He knew that teething began in embryonic life, but it became troublesome only upon the appearance of the teeth through the gums. His list did not have to do with normal children, but with those of a run-down condition or of bad heredity, the sort who develop convulsions and may in the end suffer from epilepsy.

Sequelæ of Cerebrospinal Meningitis.—This discussion was opened by Dr. Henry D. Chapin, who said that in a certain proportion of the cases under his observation during the present epidemic (eighteen or twenty in all) neuroretinitis had developed. He had mentioned this fact last spring when he presented a number of these cases before the New York County Medical Society, and one of the ophthalmologists present at that time had said that this feature of the disease was extremely unusual. Since then Dr. Chapin had paid especial attention to the eyes in cerebrospinal meningitis, and was now observing the case of a child aged four months, in which a marked neuroretinitis was present on the right side and a slight one on the left. The examination was made by Dr. A. E. Davis, who seemed to be of the opinion that this occurrence of neuroretinitis was peculiar to the present epidemic.

Dr. L. Emmett Holt said that in his experience cases in children less than three years old were generally fatal. He mentioned, however, two notable cases of recovery. In one, a male four years of age, the patient was taken suddenly ill and became unconscious, blind and deaf, with a continuous temperature for ten weeks. He then gradually regained consciousness and improved more and more rapidly, until at present, barring a slight irritability, he is as well as ever. Dr. Holt expressed the conviction that drug treatment was entirely unavailing. In the cases alluded to potassium iodid had been used until it disturbed the stomach. Inunctions of mercury had been employed, and hypodermic injections of morphin to relieve pain. Careful and unremitting attention to the patient's nutrition, however, was what seemed to have saved his life. The pulse, throughout the ten weeks of temperature, ranged from 130 to 150. Upon the return of normal temperature it suddenly fell, and for a few days ranged between 48 and 60. In the second case the temperature continued for twelve weeks, the patient being unconscious most of that time. The complete, although gradual, recovery in this instance as in the other was plainly due to the care of nutrition. There was extreme emaciation in both cases and death from exhaustion would probably have resulted had this care been omitted. In a third case mentioned by Dr. Holt a secondary hydrocephalus had developed, the head being two and a half inches larger than normal for the child's age. The symptoms pointed to a persistent basilar exudate. Dr. Holt had seen the eruption several times early in the course of the disease; in one case it was so intense as to suggest the diagnosis of measles.

Dr. Jacobi said that in the present epidemic he had seen some eighteen cases of cerebrospinal meningitis, with a death rate lower than he had expected, between 30 and 40 per cent. In a few cases he had seen the eruption. Deafness seemed to occur with unusual frequency, three of the eight or nine cases in his ward becoming hopelessly deaf. He could not say why the eyes and ears were not more frequently affected, since in almost every case the nasal mucous showed an almost pure culture of the meningococcus, and opportunity for dissemination of the germs was not lacking. In the present epidemic the nasal involvment was prominent.

Dr. La Fetra said that in view of the fact that the younger the patients the higher the death rate is, any discussion of the mortality must take the age of the subjects into consideration. During the summer he had seen eighteen cases at the Babies' Hospital and two at the Vanderbilt Clinic, all under three years. In nineteen cases diagnosis was confirmed by lumbar puncture. In fourteen the fluid drawn showed positive growth, in four there was no growth, but pus cells and an excess of fluid under pressure. Necropsy confirmed one case. In 20 per cent. of the cases under examination Dr. Marple discovered a neuroretinitis. Eleven of the twenty cases were boys and nine girls. Eight were between three months and a year old, seven between one and two years, four between two and three years. The patients were brought to the hospital at from two days to three months after the development of the disease. In ten vomiting was reported, generally with convulsions. Fever and convulsions occurred in eight cases. In six the disease had begun with cough. The temperature was from 102° to 106° F., varying with the stage of the disease, occasionally remaining normal for some time, and then rising again. In sixteen cases the neck was rigid. Depression of the fontanel was noted in two cases. Tàche cerébral was noted in sixteen cases.

Thirteen showed an irregular pulse at some time, seven being regular. In one instance, a patient three years old, the pulse was irregular and slow. In all cases the rhythm and force were remarkably regular most of the time. Respiration of the Cheyne-Stokes type was found in one case, regular in thirteen and irregular in six. All cases showed apathy and irritability. Sixteen cases showed Kernig's sign at some stage, whereas in four, three of which died, it never appeared. In one case Babinski's sign was observed. No record was made of Macewen's sign. Three cases showed petechiæ, and one, seven months old, bilateral herpes. Twelve cases showed opisthotonus, four tremor. In all wasting or marasmus was marked and distressing. The earliest case was recorded as beginning in January, twelve began between April 1 and May 30. Sixteen cases proved fatal, two were cured after an illness of three months and six weeks respectively. One case developed a chronic hydrocephalus.

Dr. Northrup described a case which terminated fatally after a course of 135 days. The patient was a girl of fourteen years, athletic and robust. Eruption on the lips was marked and emaciation extreme. Every effort was made to increase her ability to assimilate food, but to no purpose, and death resulted from exhaustion. During the epidemic ten cases had come under Dr. Northrup's observation in private practice. eight resulting fatally, two recovering after an illness of five and six weeks respectively. One case seen at the hospital recovered from the disease, but remained deaf, blind and idiotic. The recent epidemic had been characterized by extreme variability.

Dr. William L. Stowell said he had observed eight cases, one of which recovered with an endocarditis which began about the third week of illness and continued eleven weeks, the patient eventually making a complete recovery. Six cases terminated fatally, one dying in convulsions after six weeks' illness, during which a choroiditis developed. One patient made an uneventful recovery. Some years ago Dr. Stowell had observed a case in which total blindness was apparent, but the atrophy of the optic nerve was evidently not complete, as sight had gradually returned, although the patient's mental condition was much impaired.

Dr. W. M. Leszynsky had seen more than thirty cases during the epidemic, and noted, as had Dr. Northrup, an extreme variability in their symptoms. One case, a male of ten years, showed no rigidity, no abnormality of the reflexes, and merely remained in a state of semiconsciousness, being able to answer questions from time to time. Diagnosis was made by lumbar puncture. The pulse was slow, the temperature below normal. The patient died after about four days. Another case, also terminating fatally, developed a corneal lesion resulting in perforation and the loss of the eye. The patient, a girl, was so emaciated that the skin ulcerated over the protruding bones of the pelvis. Dr. Leszynsky had found optic neuritis in but few instances, although ophthalmoscopic examination had been made in routine. Several cases had recovered entirely after a bad prognosis. He had seen no fulminant cases.

Dr. Northrup said he had seen one case of that type, in which the patient was a raving maniac for twenty hours after the onset of the disease, which then terminated fatally. In another the patient died after fourteen hours.

Dr. Frank Fielder had seen a patient like the one mentioned by Dr. Holt, in which a secondary hydrocephalus with basilar exudate developed. The patient was taken ill early in May, supposedly with pneumonia, which later merged into cerebrospinal meningitis. The child was brought to the Post Graduate Hospital on June 1 in an unconscious condition, with an irregular temperature fluctuating between 106° F. and normal. Diarrhea and gastric irritabilty were present. Later Klebs-Löffler bacilli were found in the nose and throat, and the child was transferred to the Willard Parker Hospital. For some thirty-five days the patient remained unconscious, with marked retraction of the head and nystagmus. The muscles of the arms were contracted, and the hands and feet flexed. Afterward the case was transferred to Bellevue, where some lucid intervals were now observed. Lumbar puncture, done several times at the Post Graduate Hospital, showed clear fluid four times, turbid and bloody once, but never a positive identification of the meningococcus. A puncture made at Bellevue about September 15 revealed meningococcus. The case is believed to be one of chronic basilar meningitis.

Dr. Henry Heiman spoke of several patients who had been observed in Dr. Koplik's wards. In one, after sixty days, symptoms of hydrocephalus with pronounced opisthotonus developed. Repeated lumbar punctures were continued, gradually increasing the amount of fluid drawn off, until 175 c.c. were taken. Fluctuating temperatures were the rule. One patient, a male sixteen years old, displayed the fulminating type of the disease, and lumbar punctures gave a purulent fluid, containing meningococcus. Subsequent recovery was complete.

PHILADELPHIA PEDIATRIC SOCIETY

October 11, 1904.

D. J. H. Jopson, *President.*

Stenosis of Larynx Following Typhoid Fever.—This case was presented by Dr. George B. Wood. Dr. Jopson had seen the patient in August, and introduced a tube into the larynx, a process performed with difficulty, although the tube chosen was much smaller than normally demanded by a child of that age. The absence of any obstruction below the tube was evident from the fact that the child breathed through it. It seemed advisable not to allow the tube to remain, but to try gradual dilatation subsequently doing away with the tracheotomy tube. One week afterward, however, it was discovered that the larynx would not receive even the smallest intubation tube without the use of an anesthetic, and this was put off until later. Intubation might be contra-indicated by much granulation tissue and active ulceration of the larynx. The pathologic condition in this case was different from that following diphtheretic involvement of the mucous membrane of the larynx, since the space between the cords is filled up with granulation tissue, interfering with gradual dilatation by intubation tubes, a process proven better than thyroidotomy in diphtheritic stenosis. He could not say whether this granulation was likely to disappear of itself.

Dr. H. M. Fussell had seen two patients suffering from typhoid fever in which perichondritis had developed, both males, one thirty, the other seventeen years old. In the elder of the two it began as a simple hoarseness during convalescence from the fever, and excited no apprehension until stenosis and severe cyanosis followed. Operation was refused and death ensued. Dr. Fussell presented a photograph, showing that the autopsy revealed complete necrosis of the cricoid cartilage. In the younger patient hoarseness developed on the fortieth day of a severe attack of typhoid, and the boy narrowly escaped death by reason of the suddenness of the onset of stenosis and impossibility of securing a surgeon promptly. Dr. A. C. Wood performed a tracheotomy, the tube being withdrawn after six months, and slight stenosis only being apparent thereafter.

"Surgical Complications of Typhoid Fever," by Dr. Keen, gives statistics indicating that stenosis of the larynx occurs chiefly in males, and with comparative rarity before the fifteenth year.

It usually develops late in the disease or well on in convalescence, and there is great danger that the slight hoarseness be overlooked. Mortality is very high, but chiefly through lack of prompt surgical aid, and could be much reduced if the appearance of the hoarseness were the signal for making preparations for a tracheotomy in case of severe stenosis.

ENLARGED TUBERCULOUS BRONCHIAL LYMPH NODES, CAUSING PECULIAR PRESSURE SYMPTOMS.—This case was reported by Dr. T. S. Westcott, who had observed it in a child who died when four months old. The autopsy showed that one of the bronchial nodes was completely softened, the size of a pigeon's egg and pressing upon the descending vena cava. For two weeks before death, if the infant was so placed that the dorsal segment of the spinal column was concaved a pronounced cyanosis of the head, neck and arms resulted. Miliary tubercles were found studding the lungs, and several in the spleen. Bronchopneumonia of the right upper lobe was the immediate cause of death. The child's birth took place in a private room of a hospital where a case of advanced pulmonary tuberculosis was in progress in a room on the opposite side of the corridor. That the infection occurred not long after birth is evident from the early appearance of the disease (the first signs of ill-health being noted when the child was two months old), and by its advanced stage in the bronchial lymph nodes, while an intrauterine origin is rendered unlikely by the facts of the family history. There was some slight evidence of a tendency to tuberculosis in the mother's family, but both she and the father were in excellent health. The child had also been well for the first two months, and had been breast fed entirely. Dr. Westcott was inclined to believe in infection from the patient in the opposite room, either through the medium of nurses or air.

Dr. Willson noted that the conditions under which the cyanosis occurred were contrary to those usually noted in adults, where a recumbent position seemed to produce or increase the cyanosis. Dr. Willson was inclined to believe the infection of intrauterine origin, in view of the fact that the child's grandparents had had tuberculosis, that rickets had occurred in a brother and sister, and that another child of the same father and mother suffered from a chronic diarrhea that might be of a tuberculous nature.

Dr. D. J. M. Miller wished to know whether the signs ordinarily given in text books as evidence of enlarged bronchial nodes, such as Eustace Smith's sign, dulness under the sternum, etc. He was answered in the negative, and said that he had seldom found them himself, because the nodes seldom were enlarged enough to produce signs of pressure like those resulting from aneurysms or mediastinal tumors. He had found neither the paroxysmal cough, the manubrial dulness nor the Eustace Smith sign as often as the books implied in examining children with enlarged bronchial lymph nodes. He was inclined to agree with Dr. Westcott's view of the probable source of infection.

Dr. Weber explained that the autopsy showed plainly why the cyanosis resulted from the position described. The nodes were attached to the vena cava on the right side and somewhat behind.

Dr. Westcott repeated and emphasized his reasons for thinking that the patient in the opposite room might possibly have been the source of infection, and explained that the diarrhea of the second child, from which it had entirely recovered, was undoubtedly due to a subacute catarrh of the bowel.

Typhoid Fever with Uremic Onset.—Dr. A. Hand, Jr., reported the case of a female child of three years, who came under his observation at the Children's Hospital after being ill for four days. The symptoms present were fever, anorexia, malaise, cough, vomiting and pronounced constipation. For forty-eight hours she had been exceedingly drowsy, and had constantly grown thinner and weaker.

The physical examination gave largely negative results. The pulse was weak and intermittent, and the child's condition plainly toxemic. Examination of the urine showed albumin and many hyalin, granular and epithelial casts. Widal test negative; leukocytosis of 12,560.

Symptomatic treatment was adminstered, with rest in bed, and at the end of fifteen days her condition seemed to be normal. A few days later, however, her temperature was 98.6° F. in the morning and rose five degrees during the day. The next morning it was still higher, and the patient in an unconscious condition, followed by convulsions. Until afternoon the convulsions were controlled by hot baths, morphin and bromide, but as no permanent relief was observable a lumbar puncture was done in the evening, withdrawing 50 c.c. of normal fluid. Prompt cessation of convulsions followed with return of consciousness an hour later. For five days the temperature did not fall below 102° F., then dropped to 99.4° F. in the morning, rising to 100.6° F. in the evening, followed by a febrile stadium of remittant type and increasing severity for ten days. At that time the temperature began to subside and reached the normal point six weeks after the beginning of the disease. During this last period a Widal test gave positive reaction. Recovery was uneventful. Typhoid fever beginning with symptoms of acute nephritis is a type of the disease recognied by the text books and lumbar puncture as a means of relieving such symptoms is equally well established, though of comparatively recent date.

Dr. E. E. Graham said that he was much interested in this case, as he considered it a rare complication of typhoid fever. He said that the acute nephritic condition seemed to be altogether dependent on the typhoid toxemia, and patients recovering from the typhoid generally recovered from the nephritis, although there was a high mortality in cases of acute nephritis complicating typhoid.

Dr. Hand added that the last urinanalysis gave no evidence of nephritis.

Dr. Hand also called attention to a case of urticaria following an attack of diphtheria, in which the attending physician had not employed antitoxin. He wished to show that certain attacks, laid to the door of antitoxin, might occur quite independently of it. Dr. Hand also reported a case of measles, in which the rash first appeared on the legs, spread to the trunk and neck, whereas the face showed only an erythema.

EDITORIAL

INFANTILE CONVULSIONS AND EXCESSIVE FAT-DIET

Year by year new facts pertaining to infant feeding are becoming to be recognized with increasing definiteness. A large number of heretofore inexplicable conditions have been encountered and the snare and delusion of auto-intoxication has done more to cloud their etiology than it has contributed to the understanding of the more precise factors at work.

We are indebted to D. L. Emmett Holt for the taking out of some conditions from this general group of auto-intoxications and for the more definite diagnosis of a distinct type of understandable intoxication as distinguishable from musty haze of an indefinite apellation.

In the Medical News of January 7, 1905, he contributes a short but striking paper on some forms of intoxication due to excessive amounts of fat in the diet of infants.

As he points out, the general practitioner has come to recognize the dangers and the signs of excessive amount of proteid in an infant's diet, and we are all more or less familiar with the excessive fermentations and consequent intestinal disturbances due to excessive amounts of carbohydrate, but up to the present time the digestive disturbances that can follow excessive amounts of fat have not been grasped.

Holt shows that in a number of infants who have been fed for some time on a milk which is particularly rich in cream (5-7 per cent.) or 2-3 per cent. above the amount of cream present in ordinary milk that an almost typical cycle of symptoms may develop. In many of these cases the child may give the impression of being distinctly well fed. He may be fat and healthy, but suddenly for no apparent reason convulsions accompanied by high temperature develop. In others there may not be the evidence of a healthy growth, but the child develops habitual vomiting and later convulsions.

In these and many other instances the acute and chronic disturbances of digestion, he thinks, have been due largely to high fat perectages in the food, while it has been recognized that gastric disturbances, habitual vomiting, frequent regurgitation of food, continued fermentation, and finally gastric catarrh may follow the excessive use of fats; it is worth while to recognize the fact that severe nervous disturbances, such as convulsions, may result from a diet over rich in fats.

Laboratory feeding has frequently erred in this respect and Dr. Holt deems it sufficient to call attention to this fondness on the part of the physician for the rich Jersey milk as something to be carefully corrected if serious results are to be avoided.

In all of the patients reported on, regulation of the diet, particularly with reference to the fat, and thorough intestinal hygiene has brought about happy results.

PHYSICAL EDUCATION AS AN INVESTMENT

The universal interest in popular education and the excellent and widespread methods to popularize educational ideals in the United States were prominent facts that were widely commented on by the recent Mosely Commission on Education. As is well known, they came to study the educational methods here in vogue, and while they found that some were not by any means ideal, the Commission was unanimous in their approval of the aims, if not always the means, of the educators of the masses of our children.

Much has been done, but there is still a great deal more to do, and that particularly in the line of sanitary education. The "stick out your tongue" and "show your back hair and scalp" routine of the sanitary school inspectors is of immense value, but comparatively few cities in the United States have their school inspectors, whose duty it is to exclude contagious diseases from the schools. They all should have them, and the taxpayer will find it money well invested. Fewer policemen and more teachers skilled in sanitary science is the line of construction.

It is the duty of the members of our profession in the various communities throughout this country to inaugurate methods of physical education for the growing youth and maiden. Health is a better asset than bookish information, and we can show the taxpayer, if we take the trouble, that money spent in the sanitation of our schools and in healthy physical education exercises is a good investment.

ABSTRACTS

Poisoning in an Infant from a Carbolic Dressing.—Louis E. Stevenson, B.A., M.B., B.C. (Lancet, May 7, p. 1279).—An infant, aged six weeks, was circumcised on March 10. The wound was dressed with lint soaked in carbolic oil (1 in 20). Early next morning he vomited. During the afternoon the napkins were stained a dark color. The carbolic dressing was discontinued. On March 12 he was rather restless. The appetite was poor, and the urine was scanty and dark-colored. There were two motions, one of which was dark. Towards evening the urine was more free and the appetite was better. He had a very restless night. On the 13th the motions were normal. The eyes had a glassy appearance, with the eyelids somewhat injected. He was pallid, but had a fairly good appetite. There were twitchings in the limbs at intervals all day. He slept better at night. On the 14th the symptoms continued. At 6 p.m. there were rose-colored patches on the chest and abdomen. He slept well. On the 15th the rash was very thick over the chest and abdomen. At 9 a.m. the child became extremely pallid, with feeble pulse. He was ordered brandy, 5 drops every 2 hours. There was a second fainting attack about 11 a.m. The appetite was good. At 6 p.m. the rash was disappearing, but a slight rash developed on the back. On the 16th the rash was thick on the back and slight on the hips, neck, and face. The pallor was still marked. On the 17th the rash had almost disappeared. The conjunctival injection and the glassy appearance of the eyes were rapidly disappearing. The writer has used the 1 in 20 carbolic oil in many cases of circumcision and has never known a case of poisoning before.

Itching.—Itching may be due to one of a variety of causes. Excluding the parasitic affections the prominent causes are intoxications, either autogenous or exogenous, as diabetes, jaundice, etc.; certain nervous affections; and very commonly some cutaneous disease. Pruritus may also be due to senility. The constitutional treatment must, of course, vary with the etiology. In the relief of the itching itself, however, aside from the treatment of the underlying condition, certain remedies offer some promise of relief. The patient should remain in a room as far as possible of uniform temperature; frequently the envelopment of the part with cotton, or damp bandages, exercises a very beneficial effect. The following applications are recommended:

℞	Zinc oxide	
	Talcum	
	Glycerine	
	Water	of each ʒvi

Or this ointment:

℞	Ichthyol	gr. xxx
	Bismuth subnitrate	gr. xxx
	White precipitate	gr. xxx
	Vaseline	ʒv

Menthol in the form of a 2 per cent. alcoholic solution is frequently very valuable.

Other prescriptions recommended are:

℞	Menthol	
	Chloral	
	Camphor	aa gr. I
	Vaseline	ʒss

℞	Naphtol	ʒII ss
	Ether	q. s.
	Menthol	gr. x
	Vaseline	ʒvi

℞	Salicylic acid	gr. xv
	Tumenol	gr. lxxv
	Zinc oxide	ʒiij
	Amidon	ʒiij
	Vaseline	ʒvi

—*Journal des Practiciens.*

Bronchial Asthma in Infants and Children.—La Fétra, in *Archives of Ped.*, states that the great majority of the asthmatic attacks are due to bronchial spasm, therefore the treatment should point toward relaxing them. He recommends medication by inhalation as of first importance. In infants where the attacks so closely resemble capillary bronchitis, he recommends steam impregnated with creosote, twenty drops (1.30) to a pint of water boiling in a croup kettle, which in most cases relaxes the spasmodic condition. In older children the niter paper, with or without stramonium, is useful. When the spasm becomes intense and marked dyspnea is present, chloroform inhalations are indicated.

As soon as the infant can swallow, the following may be given to relieve the symptoms:

℞.	Antimonii et potass. tartratis..gr. 1/100		0006
	Pulv. ipecacuanhæ............gr. 1/20		003
	Nitroglycerini ....gr. 1/100-1/50		0006-.0012

M. Fiat chartula No. i. Sig.: At one dose, to be repeated every half-hour for three doses, or until relief is procured.

[We should hesitate in advising such large doses of nitroglycerin, repeated so often.]

The author has also derived great benefit from the administration of atropin in doses of grain 1/2000 every two hours until the face flushes. A child of two or three years can take, as a rule, two or three of the above doses before this symptom appears. After the attack has passed off the atropin should be given two or three times a day. If the stomach shows disturbances it should be emptied by a dose of syrup of ipecac. In cases of long standing the following mixture is recommended:

℞.	Potassii iodidi....................gr. xx	1	30
	Morph. sulphatis.................gr. 1/3		02
	Tinct. belladonnæ.................m. xx	1	30
	Spiritus etheris comp.................ʒiii	12	
	Aquæ q. s. ad.........................℥ii	60	

M. Sig.: One teaspoonful every three or four hours.

Acetonuria and Death after Anesthesia.—E. G. Brackett, M.D., J. S. Stone, M.D. and H. C. Low, M.D. (Boston Med. and Surg. Jour., July 7).—A series of cases was observed at the Children's Hospital, Boston, in which death occurred in peculiar circumstances.

On October 6, 1903, a boy, aged ten, suffering from infantile paralysis, but otherwise apparently healthy, was admitted. Four days later he began to vomit persistently light green fluid. The bowels had acted freely and the abdomen was soft and distended. The pulse became very weak and rose from 90 to 150 and the temperature rose to 105.8°. He became unconscious and died twenty hours after the onset of the symptoms.

On the same day a girl, aged eight, was admitted, also suffering from infantile paralysis. She seemed delicate but otherwise was in sound health. Several times in the preceding year she had had attacks of persistent vomiting with collapse. Four days after admission three tendon transplantations were done under ether. The operation lasted one and one-half hours and was not severe or attended by hemorrhage. The child took the ether badly and during the operation had a rapid pulse. Twelve hours after recovering from the anesthetic she seemed in fair condition. Then persistent vomiting suddenly began. The pulse became weak and rose to 190 and the temperature rose to 106°. The vomiting lasted about thirty hours. She gradually sank into a delirious stupor and died forty-two hours after operation.

On November 17 a girl, aged five years and six months, with extensive infantile paralysis, had the fascia on the upper and outer part of both thighs divided. She recovered well and was comfortable up to thirteen hours after the operation. Then she began to vomit. Twenty-four hours after operation the face became cyanotic, the extremities cold, the pulse weak and rapid, and the expression anxious. She gradually became comatose and died forty-eight hours after operation. A peculiar sweet odor from the breath led to examination of the urine for acetone and diacetic acid, which were found.

On December 17 two girls, aged six and eight respectively, with extensive female paralysis, were admitted. One began to vomit after six hours and the other after fifteen hours. Both became stupid; there was an odor of acetone from the breath and the urine contained acetone and diacetic acid. Both recovered.

On December 26 a girl, aged four, was admitted. For six days she had been vomiting and the bowels had not acted. The odor of acetone in the breath was very strong and acetone was found in the urine. Intestinal obstruction caused by a Meckel's diverticulum was relieved by operation. After recovering from the operation she became unconscious and died at the end of twenty-six hours.

Subsequently a sweet odor from the breath was noticed in a number of patients after operation, and acetone was found in the urine. In most of them vomiting occurred and some of them showed marked prostration. Only one case was fatal. In the fatal cases the necropsies showed some fatty degeneration of the liver, kidneys, and muscles.

Death and anesthesia with acetonuria has been described. In 1894 Becker reported from the Bonn clinic three fatal cases after operation on diabetic subjects, whose condition previously had not caused any apprehension. Brewer reported a fatal case of acetonuria after operation for appendicitis (Annals of surgery, Oct., 1902). Dr. L. G. Guthrie published a paper on "The Fatal Effects of Chloroform on Children Suffering from a Peculiar Condition of Fatty Liver" (Lancet, July 4, 1903, p. 10). The symptoms resemble those of the cases now described. He thought that death was due to auto-intoxication brought about by the fatty condition of the liver, the shock of the operation, and the chloroform.

Acid auto-intoxication, apart from diabetes, has been described. After anesthesia in healthy persons Becker found a distinct amount of acetone in the urine. But in one of the fatal cases now reported and in some of the milder ones the symptoms occurred without operation or anesthesia. The writer suggests that the effects on the nervous system of admission to hospital—home-sickness, dread of operation, and so on—have disturbed the metabolism and produced acetonuria. In addition to stimulants, bicarbonate of soda was given to combat the acid intoxicaiton, and seemed to have a beneficial effect.

Two Cases of Infectious Splenic Anemia in Childhood in a Family.—Dr. Pitini (Gazetta Medica Lombarda, March 28, p. 120)—A boy, aged three, came under observation. His sister, aged four, died three years before from anemia, accompanied by enlargement of the liver and spleen. The boy had measles a year before and then began to grow thin and had interrupted fever, which was higher in the evening. The abdomen swelled on the left side and the feet and face were often edematous.

He was very lean and pale. The glands were not enlarged. The gums were swollen and easily bled; the internal surface of the left cheek, opposite the last molar teeth, showed a circular ulcer. The liver was enlarged; the spleen was swollen, hard, and indolent. Blood examination showed 38 per cent. of hemoglobin, 2,225,000 red and 10,500 white blood cells. A virulent diplococcus was isolated from the blood.

Case 2.—His brother, aged eight months, had always been very thin and pale. There were no swollen glands. The liver and spleen were enlarged. Blood examination gave 40 per cent. hemoglobin, 2,500,000 red, and 8000 white blood cells. In both cases the fever ranged from 100.4° to 101.4° in the morning to 102.2° to 103.1° in the evening. The history excluded syphilis; the blood examination, malaria, leukemia, and pernicious anemia. The only diagnosis was therefore splenic anemia. The first child was in a desperate condition. Iron and arsenical treatment proved nearly useless. The second one died from relapsing gastroenteritis.

Gonorrheal Inflammation of the Uterine Appendages in a Girl of Three and a Half Years Detected by Bimanual Examination.—George Carpenter, M.D. (Brit. Jour. of Children's Diseases, Oct., p. 437).—A girl, aged three and a half years, was brought to the Evelina Hospital on November 3, 1898, for a vaginal discharge of six weeks' duration, pains in the lower abdomen, and frequency of micturition. The pus from the vulva contained numerous gonococci. Bimanual examination by the rectum showed on the right side an irregular elastic tumor attached to the uterus at the upper part, and from which it could not be differentiated. Its free extremity was movable. It presented a central depression, and measured 1½ in. or more lengthwise and ¾ in. across. Rolled between the hands there seemed to be an ill-defined cord upon it, which might have been the Fallopian tube, but if it were so it was not enlarged. On the left side the Fallopian tube apparently ended in a fusiform swelling attached to the side of the pelvis about 1¼ in. long and ¼ in. broad, probably the enlarged fimbriated extremity. If it was the ovary, that organ was enlarged. Lying below this body were two rounded masses somewhat movable, one about the size of a small pea and the other of half that. All the parts had rather a woolly and indistinct feel, which was thought to be due to associated pelvic peritonitis.

On December 1 the condition had considerably changed. The left ovary and tube were of normal size. The right tube was decidedly enlarged, and associated with it was a very elastic tumor ½ in. or more in diameter. All parts were freely movable. There was still a purulent discharge from the vagina.

On January 5, 1899, the condition of the ovary and the Fallopian tube on the left side remained unchanged. Considerable improvement had taken place on the right side. The Fallopian tube was but slightly enlarged, and the part associated with it, which might or might not have been the ovary, was also much smaller, but still large. The vaginal discharge was as great as ever.

On April 6 the os uteri was examined with a Fergusson's vaginal speculum especially made for the purpose. There was no discharge from it, but the cervical mucous membrane was reddened, and had lost its sheen. The mucous membrane of the vagina was reddened in patches. At the end of May the discharge was less. She remained under care until December 14, during which time she passed through attacks of whooping-cough, measles, and varicella.

Several cases of localized gonorrheal peritonitis in little girls are recorded, but in none does a bimanual examination appear to have been made. The case shows the value of this method which the writer has long advocated. This case also shows that pelvic disease due to gonorrhea, in some instances, tends to spontaneous recovery, and that without such examinations is likely to be overlooked. Probably there was pelvic peritonitis. There was certainly salpingitis on the right side and probably on the left.

Gonorrheal Salpingitis in a Child.—L. A. Bidwell, F.R.C.S. (Brit. Jour. of Children's Diseases, Oct., p. 435).—A girl, aged six, was seen on June 2, 1902. Her parents had some suspicion that she had been assaulted, and there was superficial ulceration inside the vulva extending toward the urethal orifice. Simple ulceration was diagnosed and an astringent was prescribed. On the 25th there was painful swelling of the right foot. Examination showed redness and edema over the flexor tendon sheath. The temperature was 102°, and the discharge was about the same. Next day, as the temperature was still high, the foot more swollen, and the pain more acute, an incision was made and a clear fluid was let out of the tendon sheath. Further examination revealed pus issuing from the os uteri. On the 28th the discharge was less, but the child complained of abdominal pain. On the 29th the temperature rose to 103° and the abdominal pain was severe. There were rigidity of the right rectus and swelling to the right of the middle line in the hypogastrium, which was very tender but not dull on percussion, and retention of urine. On the 30th the temperature fell to 100°, the discharge was diminished, and the abdominal swelling was less. Nothing was felt per rectum. Mr. W. Watson Cheyne saw the child and agreed in the diagnosis of subsiding gonorrheal salpingitis. The discharge showed gonococci in large numbers. The child seemed to improve for three days, but on July 4 the temperature rose to 102°. On the following day it was 102° and she was in great pain. Per rectum a very tender swelling was felt on the left side of the pelvis. On the 8th the pain was more severe, the abdomen was slightly distended, and the swelling was distinct. Laparotomy was performed. Slightly purulent fluid was found in the peritoneal cavity and flakes of lymph on the intestines. A dense mass was felt on either side of the pelvis and on separating adhesions pus escaped. Both tubes were full of pus and were removed. The pelvis was sponged out and a drainage-tube was inserted. On the 30th the wound was quite healed. The discharge, however, had not ceased and still contained gonococci. On September 17, as the discharge was still coming from the uterus, the organ was curetted under chloroform after dilatation of the os. The discharge ceased within a week. Some months later the child was in perfect health.

Gonorrheal salpingitis is very rare at such an early age; its course appears to be more acute than in adults. The operation was not performed until all hope of cure by other means had been abandoned. The ovaries were left in the hope of avoiding future arrest in the development of the child. It is interesting that the discharge did not stop after salpingectomy, but persisted until the uterus was curetted. The lesson of the case seems to be that in a case of gonorrheal vaginal discharge, the patient should be anesthetized, and if the discharge comes from the uterus the os should be dilated and the uterus curetted. In this way extension to the tubes should be prevented. The inflammation of the tendon-sheath was undoubtedly gonorrheal.

Acute Catarrhal Otitis Media.—Dr. L. A. McClelland (Brooklyn Med. Jour.) says that in the early stages of otitis media there are two immediate cosiderations, viz., to relieve the pain and abort further involvement. This may frequently be accomplished by thorough cleansing of the nose and post-nasal space, preferably with cotton on probe; then the application of 1-10,000 adrenalin chloride solution on cotton, when the cleanness and patency of the naso-pharyngeal entrance will enhance the chance of re-establishing the intra-tubal and tympanic pressure by nature, or by the aid of the Politzer bag. Liberal flushings of the canal with water of 110° to 120°, delivered in a constant stream from the ordinary fountain syringe, using the smallest tip, which should be placed on the floor of the canal but not pushed into it, will prove of much service in relieving the prevailing condition in mild cases. The author believes that this simple procedure is not practiced at sufficiently regular and short intervals by many, who fail of the object in consequence. Half hourly intervals between the two-quart irrigations is often indicated. Leeches to the tragus will often dissipate the agony of a suffering child so promptly that sleep will follow forthwith. A dressing to the ear may be found most comfortable, and his preference is a large wad of warmed absorbent cotton packed loosely about it. A hot foot-bath and cathartic are often beneficial. Occasionally a hypodermic of morphine may be necessary.

Failing to abort the affection, sterilize the canal and incise the membrani tympani while the patient is under the influence of either nitrous oxide gas, ether, chloroform, or a local anesthetic; *e. g.*, alcohol, carbolic acid, and cocaine (saturated solution), equal parts. After operating irrigate the canal with sterile warm saline solution or Thiersch's solution.

The common practice of insufflating boric acid into the canal may be fraught with danger, owing to its tendency to cake and occlude the canal, thus interfering with drainage. Protect the tympanum from further infection by carefully dressing the canal with sterile gauze or cotton, being diligent in its frequent removal. Cleanse and redress very often, always remembering to dry the canal after irrigation. Follow up with inflation if this is indicated.

Fluoroform in Pertussis.—DR. STEPP, of Nuremburg (Therap. Monatsch., Nov., 1904), reports in detail twenty-two cases of whooping-cough which he treated with fluoroform. The results have been so uniformly satisfactory that it is very probable, according to the author, that the drug exerts a specific action on the pertussis toxin. The remedy itself, given in the form of fluoroform water (2 to 2½ per cent. solution), is odorless, tasteless, and absolutely non-poisonous. The dose, even for the smallest children, is a teaspoonful every hour. For older children, a tablespoonful.

Hemorrhoids in Infants.—J. COMBY (Archives de Médecine des Enfants, November, 1904), says: "Hemorrhoids are not rare in infants, if systemic examinations are made. A few congenital cases have been noted. The writer gives a clinical history of five cases from two to five years of age. Anal hemorrhage frequently directs attention to this condition. The symptom is often associated with internal hemorrhoids, not accompanied by pain; the condition of the rectum can be ascertained only by a rectal examination. External hemorrhoids also occur in very young children, but they present no difficulty from the standpoint of diagnosis. As a rule, the lesion is well tolerated in children, and the prognosis is good in the absence of complications. Spontaneous recovery is rare, most cases requiring operation. As palliatives, astringents may be used in the form of suppositories. For the relief of hemorrhage adrenalin may be employed."

Acute Articular Rheumatism in Children.—A. BAGINSKY (Berl. klin. Woch., Nov. 28, 1904) has never found the blood essentially abnormal in this condition. The anemic appearance is probably due to the lessened blood pressure and the smaller amount of blood in the vessels. He protests against the dumping of chorea in the general receptacle for infections affections—there are probably two main groups, the rheumatic and the nervous choreas. In 64 cases of chorea he found only 20 in which there were any rheumatic antecedents. Aside from chorea, nervous manifestations were rare in his experience with rheumatism, except that cerebrospinal meningitis was sometimes associated. The distinguishing feature of acute articular rheumatism in children is the early and almost inevitable involvement of the heart. All except 7 of the 76 cases in his experience presented evidences of lively irritation or inflammation in the heart. In 17 cases there was apparently complete restitution of the heart but in 41 others some cardiac defect developed sooner or later. The proportion of cases with intact heart was 12 per cent.; of complete recovery, 23 per cent.; of permanent heart defects, 62 per cent., and of deaths, 9.9 per cent. The post-mortem findings demonstrated that the special and most prominent anatomic reaction of the heart in childhood to the irritation of the rheumatic virus is a fibrinous pericarditis with adhesions, and a tendency of the fibrinous exudated and proliferating products of the inflammation to become transformed into connective tissue, with the heart and pericardium completely grown together. The organism usually manages with this immovably fastened organ until the stress of puberty. Salicylic medication has no effect on the heart complications, either for prevention or cure. He relates experiences with various drugs, including subcutaneous injection of carbolic acid, all to no avail. The only one that seemed to do any good was potassium iodid, from 1 to 3 gm. a day. This seemed to alleviate the symptoms of severe inflammation in cases of pronounced pericarditis and endocarditis. It sometimes had a magical action in reducing the fever, moderating the local inflammation and combating the most dangerous symptoms of the disease. His experience with antistreptococcus serum has been slight and rather unfavorable.

Prevention of Measles and Whooping-Cough.—C. S. Caverly (Am. Med., Dec. 24, 1904) deprecates the tendency on the part of the profession and of the public to view these diseases as harmless. Although the death rate from scarlet fever has been lessened considerably by judicious preventive measures, that from measles and whooping-cough remains unchanged, these diseases causing more deaths than scarlet fever. From their fatalities they are as important as scarlet fever, or diphtheria, or even smallpox. Their prevention presents peculiar difficulties. First, the indifference of the public, shared by the profession. Second, the failure of many patients to see a physician. Third, their contagiousness at a time when they cannot be recognized; and fourth, the variable length of time that they remain virulent. There is not sufficient unanimity among doctors as to the necessity of preventing these diseases. They are difficult of early and certain diagnosis because their early symptoms are common to these and many other less severe and less contagious diseases. The schools offer the best opportunity for their spread. In catarrhal diseases of all kinds affecting the upper air tracts the child should be excluded from the school. The early communicability of measles and whooping-cough should never be overlooked.

Treatment of Lung Diseases in Children.—Dr. C. H. Murphy (Med. Council) cites the following symptoms as characteristic of some forms of lung disease in children ,and then indicates the treatment: A child from infancy to four years of age, with high temperature, quick breathing; rapid pulse, 140 to 160; hot, dry skin in early stage; auscultation reveals moist râles in one or both lungs, or patchy dulness on percussion; the child may attempt to cry, but cuts it short on account of pain; there is a little grunt at the end of expiration; there may be much thirst and restlessness; the patient is agitated and apprehensive, and all signs point to pulmonary hyperemia or congestion.

In the above condition the author recommends, if the pulse is full and rapid, with red streaks down the sides of the tongue and dry, hacking cough:

Tr. Veratri Viridis	gtt. xv
Tr. Bryoniæ	gtt. x
Aquæ, q. s. ad	℥ iv

One dram every hour.

Also:

Ammon. Chloridi	gr. xx
Antimon. et Potass. Tart	gr ¼ to ½
Aq. ad.	℥ iv

One dram ever hour alternately with above.

If the pulse be small and soft, but rapid, use aconite, 8 drops, in place of veratrum. If the breathing is rattling, or short and panting, dulness on percussion, cough worse at night, some blood raised, he adds spt. phosphorus, 20 drops, to the prescription. If there was nausea and vomiting and râles, coarse and loose, tr. ipecac, 5 drops, may be substituted for the bryonia.

When the disease is ushered in with intense cerebral symptoms, increased nervous condition, threatened convulsions, or a pronounced state of congestion, together with heat of head, redness of face and eyes, with coldness of limbs, drowsy and stupid, tr. belladonna, 5 drops, would be indicated instead of bryonia. Therefore, for a child six to fifteen months old he arranges two glasses: into one of these he puts 8 drops of tr. aconite and 6 drops tr. belladonna. Into the other he puts 10 drops each of tr. bryonia and tr. ipecac. To each glass now add 4 oz. of water. If the condition is mild, a teaspoonful of these should be given alternately every hour. If the temperature reaches 103° and pulse130-160, a half teaspoonful alternately every half hour will act much better. However, if a stimulant expectorant is desired, where there is moist râles and rattling, ammon. chloride or carb. and tartar emetic are added to one of the above, as previously stated.

The author's experience teaches that tartar emetic in very minute doses (¼ to ½ grn. to 4 oz. of water, teaspoonful every hour or two) is a most frequently indicated remedy in bronchitis and pneumonia. The indications for it are plain—cough loose, rattling, difficult breathing, cannot raise the expectoration; seems as if it all but came up.

It should never be forgotten that free movements of the bowels by the use of castor oil will assist the other remedies very much.

Keep the patient in bed in a recumbent position during the whole course of the disease. Young infants should be clad rather more warmly than ordinarily. In older children a hot mustard foot bath is of decided value. The use of steam vapor in the sick-room also helps to relieve the oppressed breathing.

The mustard plaster or turpentine stupe applied to the chest in case of great pain, or where breathing is much embarrassed from hepatization, certainly gives much relief and probably hastens a cure. The compound lobelia powder freely sprinkled over a larded cloth applied over the chest of the infant or small child gives wonderful results. It will allay the cough and often give rest as nothing else can do. It should be renewed every three hours. The second is antiphlogistine or compound clay dressing. It has the decided advantage of not requiring removal until after twelve to twenty-four hours. Thus the child needs seldom to be disturbed, and the hygroscopic action of this preparation assists in reducing the inflammation.

The question of diet is important. Water should be given in abundance. Foods should be given, as in fevers generally, in small quantities at intervals of two or three hours, and should consist of easily assimilable and concentrated nourishment. In most cases milk will prove the best article of diet; still it should never be given raw or boiled, but simply pasteurized, and if necessary, peptonized. In young children, rice with cream, and various gruels may be given. In very debilitated subjects a weak egg-nog or milk punch will combine both stimulation and nourishment.

Treatment of Scabies.—E. W. Ruggles (Buffalo Medical Journal, December, 1904), in discussing a recent epidemic of scabies, says that the disease is increasing of late years, as shown by the reports of large public clinics and also in private practice of physicians who devote attention to skin diseases. The disease is frequently not recognized, as the typical characteristics are absent. The pruritus which accompanies scabies is often out of all proportion to the discoverable lesions, which in those who bathe frequently are very insignificant, consisting of isolated scratch marks, small papules, with occasionally minute pustules. On close examination some burrows, excoriations, papules, or vesicles will be found in the spaces between the fingers and toes. The burrow rarely has the classical appearance. In the diagnosis it is not easy to isolate the acarus, as it is commonly contained in a drop of blood or the dried secretions.

In the treatment two essentials are to be met: first, to kill the parasites, not only in the skin, but in the clothing and bedding. The case should be followed until it is definitely cured. An efficient and cleanly method is Sherwell's washed sulphur treatment. The patient is rubbed thoroughly with a dry powder after a prolonged hot bath, and in addition the powder is placed on the lower sheet of the bed. Kaposi's ointment, having the following formula:

Naphthol	25 parts
Green soap	50 parts
Creta alba	100 parts
Benzoated lard	100 parts

and Stelwagon's,

Sublimated sulphur, balsam Peru	ää ℥j
Naphthol	ʒ to j
Benzoated lard or ung. petrolati	q. s. ad ℥iv

are among the best prescriptions. Two or three applications will kill the parasites, but the accompanying eczema, which is often aggravated by the treatment, may require time for its cure.

Medical Treatment of Epilepsy.—Dr. Charles L. Dana, (Publ. Cornell Univ. Med. School, I) after considering the importance to the epileptic of hygienic living, exercise and bathing, proper diet and regular bowels, outlines the medicinal treatment. Our chief reliance is still to be placed in the bromides. The average daily dose for a person above fourteen is 60 grn. Sodium glycerophosphate forms an excellent adjuvant. A good combination is the following:

Solut. Sodii Glycerophosph (50%)	℥ ij
Sodii Bromidi	℥ iij
Aquæ, q. s., ad	℥ vi

℥ j twice a day in water, in the forenoon and in the afternoon, six days in seven.

As seen, the medicine is given but twice a day, and it is important that one day, or in some cases two days, in the week all bromide medication be stopped. On this day, usually a Sunday, the patient should devote his time to cleansing his alimentary canal. Saturday night he should take a slight laxative (once a month a mercurial). On Sunday he should drink a tumblerful of hot water, containing 30 grn. of sodium bicarbonate, half an hour before each meal. After each meal he should take the following tonic:

Tinct. Ferri Chloridi (1 year old	℥ i
Ac. Sulphurici Dil.	℥ iv
Glyceriti Pepsini	℥ j
Aquæ	ʒ ij
Ol. Menthæ Pip.	m v

15 to 25 min., well diluted or in capsules, after every meal.

This mixture relieves some of the anemia caused by the bromide, and tones up the digestive organs. In mild cases or those well under control, this "remission" treatment is carried out twice a week, Wednesdays and Sundays.

Usually the above treatment lessens greatly and largely controls the attacks. Sometimes it is necessary to give one-half, or even a whole dose of the bromide-phosphate mixture in addition at noon; sometimes an extra dose is given on Saturdays.

The medication must be increased as the patient improves. Epileptic crises usually occur if the disease runs a natural course two or three times a month, often several attacks occurring together. If these attacks are suppressed for three months and the patient begins to feel secure, he should, in the fourth month, have the doses increased 25 per cent. Then they can be dropped to the former average and again increased. The better and the more secure the patient feels the more stringent should be the watch and the larger the dose. For we must secure what we have gained or start all over again. After a year's remission it is especially important to increase the medication and the general care of the patient and for two months he must be kept under the strictest surveillance. Then the regimen can be relaxed for a half year, but again and again the patient must be held up with a close rein. In this way alone can we save him. We feel some relief after fourteen months, some security after two years, and finally strong confidence after three years. Much can be done with the epileptic if he is intelligent and coöperates with the physician; or oftener if the mother is patient and watchful—and to such, if the child is not a backward degenerate and has not been wasting too many years in haphazard work, one can promise much.

This treatment consists then: (1) In short, violent exercise that works and hardens the muscles, stimulates the liver, and opens the pores of the skin. (2) A regular system of stomach-washing, so to speak, with laxatives regularly given to unload the bowel of toxins and excess of fecal matter. (3) Regular cold bathing to stimulate the vasomotor system, and a regular series of full hot baths and sweat baths to unload the skin. (4) Administration of bromides in maximum doses but given with regular intermissions, so as to rest the stomach and allow its keeping in good condition. (5) Associating the bromides with glycerophosphates, and often iron, to combat the depressing effect of bromides and its tendency to impoverish the blood. (6) Increase of medicine as the patient gets better.

The Rationale of Intestinal Antisepsis.—H. B. Hollen (Medicine, Jan., 1905) says that the summer diarrheas of infants occupy a large place in the sphere of intestinal asepsis. In dealing with these conditions the following make up the round of treatment: (*a*) withdrawal of milk and the substitution of thin broths, albumen and cereal waters, or other liquid feedings; (*b*) colon irrigation; (*c*) gastric lavage; (*d*) initial purge of calomel or castor oil; (*e*) administration of an internal antiseptic; (*f*) astringent drugs in selected cases; (*g*) tonic medication. There is some marked difference of opinion relative to the length of time milk diet should be withheld. Morse says that, in view of the relatively low nutritive value of the various food substitutes, milk feedings should be resumed in a few days, irrespective of the condition of the stools or without waiting for marked improvement. It is probably advisable however, to discontinue the use of milk until more or less well-defined change for the better occurs; in the majority of cases sufficient nourishment can be derived by the patient from some of the prepared nutrients until such favorable change supervenes. The question of nutrition is, after all, secondary to the correction of the intestinal and gastric infection.

A great deal has been written about infant alimentation, much of which may be said to be of little practical value. Suffice it to say here that the patient may be nourished by means of barley, rice, or arrowroot water; with albumen water, meat broths, or beef juice. Nutritive liquid peptone is a good preparation with which to sustain the sufferer; in it extract of malt and predigested beef are skilfully combined These nutrients are also obtainable in combination with creosote, and in this form is found a valuable medicament for summer complaint and similar affections in which creosote is of service. The ordinary diet of health is to be resumed gradually, beginning with milk wheys (which may be made from whole or skim milk) or a modified milk prepared from fresh milk, highly alkaline and pasteurized. As the patient progresses the percentage of the individual milk ingredients may be increased.

Colonic irrigation is a useful procedure in cholera infantum. An aqueous solution of acetozone, 1:3000, is suitable for this purpose and will yield good results. Zinc sulphocarbolate (five grains dissolved in two ounces of water) is also of great service. The same solutions may be employed for lavage, which is a therapeutic measure not often enough resorted to. Washing out the stomach at frequent intervals is productive of incalculable good, and treatment which omits it is to be considered incomplete. In performing lavage the irrigating fluid should invariably be lukewarm, and is best introduced in the morning on an empty stomach. Its continuance must be based on the character of the washings. The two drugs most suitable for meeting the condition of fermentation and infection present in this disorder are acetozone and zinc sulphocarbolate. In administering the former the regular solution (fifteen grains to the quart) should be diluted with one-half its quantity of water and flavored with lemon or orange juice. In this form it is acceptable; it may be given in tablespoonful doses at frequent intervals with no fear of toxic effects. The good results accruing from the use of this remedy, given orally as well as in the form of enemata, are early and unmistakable. The discoloration and putridity of the stools disappear; the diarrhea is checked; the temperature falls; pain and inflammation subside; the vomiting is controlled, and the anguish and irritability disappear. Copper arsenite is recommended in many quarters as a remedy in summer diarrhea, enterocolitis and dysentery, and in many cases seems to meet the conditions attendant upon these disorders. It has been found of considerable service employed per rectum (in solutions of five to twenty grains to the ounce) in ulcerative states of the lower bowel. As a tonic indicated especially in long-continued infections strychnine arsenate may be given.

Gastrointestinal catarrh of more or less well-marked chronicity, varying in character from a gastritis to a colitis, yields surprisingly in many instances to antiseptic therapy. In the latter condition Drake recommends the use of acetozone in 1 : 1000 solution to be taken after meals, with daily colonic irrigations. In chronic diarrheas the free ingestion of acetozone solution is recommended by Bennet, who says that he has had exceptional results following its use. In many cases of so-called "dyspepsia" the drug is efficient even after the failure of pepsin, hydrochloric acid and pancreatin to produce results. Sodium and phenyl salicylates have been found to act well when used for sarcinous vomiting and in certain cases of chronic dyspepsia with decomposition. When the analyses of gastric contents reveal the lack of hydrochloric acid, that agent should be supplied on the ground that putrefactive changes in the intestines are often due to its absence. As pointed out by Vaughan, "the only digestive secretion which is known to have any germicidal effect is the gastric juice (hydrochloric acid) ; therefore, if this secretion be impaired there is at least the possibility that the living germ will pass on to the intestines and multiply and will, if it be capable of so doing, elaborate a chemical poison which may be absorbed." When the stomachic symptoms predominate the salicylate or subgallate of bismuth is of service, and lavage with bismuth subnitrate solution may be a useful adjuvant. In this way the pain and vomiting, concurrent with catarrh, may be controlled.

A Case of Multiple Sclerosis Following Whooping-Cough.—Gustavo Minciotti (Gazz. degli osped., October 2, 1904) contributes to the study of multiple sclerosis a rare case of the disease in a child. The etiology is an infections disease, pertussis. In some published cases the interval between the pertussis and the attack of multiple sclerosis was too long to make the connection sure. In the author's case the interval was very brief, and the symptoms of multuple sclerosis appeared before those of the whooping-cough were entirely finished. The clinical history showed change in the speech of the scanning monotonous type, intention tremor, nystagmus, exaggerated reflexes and other symptoms. The diagnosis of neoplasm of the brain was regarded as impossible from the absence of pain, vomiting and other pathognomonic symptoms. Friedreich's disease does not develop earlier than ten years, the nystagmus was inconstant, the reflexes should be lost instead of increased, and the speech changes of Friedreich's disease do not resemble those of multiple sclerosis. The course of multiple sclerosis may be remittent or intermittent, the symptoms may improve or disappear. The tremor varies at different times and in different cases. The gait is distinctly cerebellar, paretic, spastic, the speech disturbance is subject to great variation.

Exophthalmos in the Newly Born.—Ordinary variations in the infant's head, which result from the pressure incident to birth. afford little more than transient interest. When, however, exudations are of such nature as to produce exophthalmos or some such serious lesion, they certainly merit the closest attention. Hugh H. Borland (Lancet, November 12, 1904) recites the history of a case in which the vault of the cranium showed evidence of protracted pressure, presenting a squashed appearance, the frontal and parietal bones being practically at right angles. The labor had not been instrumental. The child's face was pallid, and both eyes were so markedly exophthalmic that the organs protruded like goggles. This was so marked that the sclerotic coat was seen above and below the cornea and the eyelids were unable to meet. There were no ptoses. The pupils were equal and fully dilated. A few hours after birth an effusion of blood under the conjunctiva of the right eye was noticed. Paralysis of the recti followed, but this was confined to the right eye, in which the hemorrhage had been seen. On the third day an ecchymotic patch was observed on the external surface of the right upper lid. On the fifth day the paralysis of the superior rectus became less marked. On the seventh the effusion under the conjunctiva had diminished and did not encroach beyond the upper margin of the cornea. On the ninth day, when the child raised the eyeball, one-third of the cornea was above the level of the inner canthus. On the tenth day the exophthalmos was no longer evident. On the nineteenth day a clot of coagulated blood came down the nostril. Three weeks after birth there was still seen a slight degree of paralysis in the superior rectus. Three years later the child was normal in every respect. The question arises whether the pressure causing this lesion was intra-uterine or not. There was no history of hemophilia. There was absolutely no caput succedaneum, although the labor was moderately long. The mother's pelvis was normal. No instruments, it must be remembered, had been used, and it is difficult to understand how sufficient pressure could have arisen either from the head impinging upon the promontory of the sacrum or upon the pelvic floor. Whatever its origin, the bulk of the pressure had fallen on the right side of the cranium, there being little or no hemorrhage in the left conjunctiva. The discharge of the clot from the right nostril is, perhaps, to be accounted for by the fact that in children there is almost always a communication between the nasal vein and the superior longitudinal sinus in the antrum. Altogether the case was a difficult one to explain. It might arise from extreme hyperemia behind the eyeballs, or possibly from the fact that the child, on being delivered, fell to the floor, the small friable bones of the face having possibly been broken. Damage to the cavernous sinus might possibly be the cause of the trouble, but whether this was due to pressure or to inherent frailty of the blood vessels or to the condition of the blood is indeterminable. The fetal blood in that of the newly born differs in quantity and quality from that of the adult, the young infant having less blood in proportion to the entire body-weight. The author's experiments go to show that infantile blood has a higher specific gravity and higher hemoglobin percentage than the maternal blood, that the coagulation power of infants' blood is, first, very much below that of an adult's blood, and second, that this degree of coagulability is very variable.

A Case of Quadruplets.—It is rare for the human female to give birth to four children at once. Fothergill gives the ratio as one in 387,000. Annie C. Gowdey (Lancet, October, 1904) reports the case of a woman, aged thirty-six years, who, while lifting a heavy weight, felt something "snap" inside her. Typical labor pains developed within a few hours. On admission to the St. Pancras Infirmary she gave the following history: She was pregnant 5½ months and had noticed that she was unusually large; otherwise, she had had no discomfort whatsoever. The physical signs were: The abdomen was greatly distended, the uterus reaching to within three fingerbreadths of the ensiform. The fetal parts were not satisfactorily palpable. The os was dilated and the cord prolapsed. The pains subsided, and the next day a hand prolapsed and could not be returned. The child was delivered by the forceps. It weighed one pound, four ounces, and survived thirteen hours. Within the next twenty minutes three other children were expelled. These were all stillborn. The placentæ are described as follows: Two were quite separate; the remaining two had coalescing margins, with separate chorions to each. There was no post-partum hemorrhage, the recovery of the patient being without incident. Two of the presentations were transverse, one was vertex, and the other breech. The presence of the separate chorions, indicating the uniovular development of each child, is interesting, inasmuch as it is the most common mode of development in twin pregnancies, but most unusual in multiple pregnancies.

Trachoma.—A. C. Bardes (Medical Record, Dec. 31, 1904), gives an interesting account of the history of this disease, which was treated even by the ancients by methods in principle like those of to-day. After discussing the means of contagion, the symptomatology and the sequelæ, all of which stamp the affection as one requiring the utmost efforts for its suppression, the author describes his method for expressing the granules under local anæsthesia. The popular prejudice against general anæsthesia in these cases is so great that many parents prefer to have their children treated with the tedious and uncertain astringents, and it was to overcome this difficulty that the author was led to employ cocaine. After an experience with more than a hundred cases by this means, he says that cocaine expressions are without pain, and but few sittings are required in order to affect a cure. Complete local anæsthesia is obtained by rubbing into the conjunctiva a 20-per-cent. solution of cocaine and applying to the lacrymal opening some vaseline, so at to prevent the escape of the alkaloid into the nose. As soon as the lid is insensible to pain it is grasped with an expressing forceps and, with a stripping motion repeatedly executed, the granules are crushed. The operation should be sufficiently energetic to obliterate the granules without causing an undue reaction, otherwise adhesive bands may unite various parts of the bruised conjunctiva, and the contraction of the lids that follows acts precisely like the shortening produced in the cicatrical stage of trachoma. After the squeezing solution a 1-per-cent. solution of silver nitrate or a solution of an organic salt of silver can be rubbed into the conjunctiva, and the patient is instructed to call again as soon as the soreness has left the lids.

The Physiology of Nursing.—In the case of an ideal breast, during the first few minutes of a meal every suck is followed by an act of swallowing, according to J. Süsswein (Arch. f. Kinderheilk, Vol. 40, Nos. 1 and 2). The greater half of the meal is finished in the first five minutes. If the child drinks with many interruptions and if the act of swallowing occurs but seldom, then the breast is unsuitable or insufficient for the child. In judging of the sufficiency of the breast, weighing the child is a still better help than the above observations.

The Value of the Finding of Diphtheria Bacilli in Nurslings.—A thought frequently arises in the mind of the practitioner that perhaps, after all, a case from which a culture has been taken with a positive finding is not one of diphtheria. L. Schaps (Arch f. Kinderheilk, Vol. 40, Nos I and 2) agrees with Ballin that the finding of the bacillus alone gives no assurance that diphtheria is present; that rather the greater emphasis should be placed on the clinical impression. Bacteriology can furnish an aid to the latter. In supporting his contention the author reports his interesting experience in the Infants' Hospital of Dresden. Nine cases of rhinitis simultaneously presented themselves among his charges, and owing to certain repairs that were going on in the hospital, it was impossible to isolate them. There was a serosanguinolent secretion from the nostrils and excoriations from the upper lip. There was no temperature, but all the cultures gave a positive report. From 21 other and normal cases in the hospital, cultures were taken, and some of these also revealed the presence of diphtheria bacilli, although there were absolutely no clinical symptoms of diphtheria. None of the patients at any time had fever, in spite of the positive finding, in one of which the bacilli proved to be virulent on inoculation into animals. No membrane was discovered either in the nose of elsewhere. There were no pharyngeal or laryngeal symptoms, no nephritis, or nervous manifestations. All the cases received antitoxin, but it had no effect upon the rhinitis. The conclusion is that no diphtheria was present. The diphtheria bacilli in the above cases played simply the rôle of relatively harmless saprophytes, which, however, may at times give rise to a genuine diphtheria.

Antenatal Smallpox Infection.—DR. J. F. HODGSON (Lancet, Dec. 3, 1904), reports the following interesting case of smallpox in a child that came under observation in the Halifax Smallpox Hospital. The mother sickened on October 27, 1904, and the eruption of smallpox appeared on the 31st. She was admitted to the hospital on November 1st, and on the 4th, after a normal labor, she gave birth to a full-time child at 1 a.m. Twelve hours afterwards the eruption, which up to this time had been of the moderately severe discrete type, became complicated by subvesicular and circumvesicular hemorrhages. Hematuria was first noticed on the 2d. She died during the evening of the 4th. Although she was stated to have been successfully vaccinated in infancy, there was no evidence of vaccination scars.

The child was vaccinated on the same day, and on the 7th it was seen that all the four insertions had been successful. On the next day the entire skin was covered with a scarlatiniform rash, and the smallpox eruption made it appearance during the evening. Fresh papules continued to come out during the next two days, so that by the 10th the whole body was abundantly and uniformly covered with them. No change was noticed in the papules until the 12th, and then not more than half a dozen about the head had developed into vesicles, while by the 14th certainly not more than one-sixth of all the papules had become vesicular. The rest seemed to undergo no change. Up to this point the temperature had never been high; it reached 100.6° F. on the evening of the 11th, and was normal afterwards. During the morning of the 14th the child had severe convulsions, and later in the day blood was passed with the stools. The vesicles now became purple and the areolæ deep red in color, and death took place at 10:30 a.m. on the 15th. The scarlatiniform rash persisted to the end. The vaccination followed a normal course until the thirteenth day, when the vesicles coalesced, began to extend, and showed no tendency to evolution. Upon this case Dr. Hodgson remarks: The eruption appeared on the child four days after birth—that is, eight days after the appearance of the eruption on the mother and twelve days after the mother began to sicken. As the interval between infection and the appearance of the rash in smallpox is generally twelve days, the child was doubtless infected in utero and at the time when the mother was yet in the incubation stage. The time was too short for the immunity which the mother's attack of smallpox is thought to confer on the child, to have been secured. The variola was also so far advanced that the vaccina could not prevent, but only modify and stay, its progress. The termination showed that the type of the disease was a severe one, yet the vaccination undoubtedly held it in check for a period.

Phosphorus in the Milk.—Only an increased casein-content, according to A. SCHLOSSMANN (Arch. f. Kinderheilk., Vol. 40, Nos. 1 and 2), has the effect of increasing the amount of phosphorus in the milk. The prolongation of lactation, menstruation or fever has no effect on the amount of phosphorus. A part of this is held in organic union in the milk, particularly in casein; the content in other nucleones and in lecithin has not been thoroughly worked out.

Intestinal Tuberculosis in Children.—A type of tuberculosis occurring among the children of coal miners in Germany is described by R. RICHTER (Berl. klin. Woch., Nov. 7, 1904). It affects principally the intestinal lymph glands, and though rarely fatal, may constitute a grave illness. The children become emaciated, pale, suffer from abdominal pain and tenderness around the umbilicus, headache, insomnia and slight rise of temperature in the evening. The cervical and submaxillary glands are frequently swollen. This disease may progress very rapidly for a time and then take on a chronic type, which is more apt to be prolonged in the older children. After the subjective symptoms disappear anemia and general weakness persist for a considerable period. The author describes the disease to be the fact that the local milk supply is of very poor quality and the hygienic conditions are also bad. In view of the fact that Behring states that tuberculous infection in childhood protects against reinfection later in life, it is interesting to note that tuberculosis is very rare among the adult inhabitants of the district.

PEDIATRICS

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ORIGINAL ARTICLES

SOME ANOMALOUS MANIFESTATIONS OF MALARIAL INFECTION IN CHILDREN

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Ever and anon a medical writer calls attention to the fact that malaria in children does not always present the classic, the well-known, types as described in our treatises, and records this or that aberration therein. To the older practitioners, particularly those of the Southern and Western States, the clinical aberrations of greater or lesser magnitude, and more than that the protean forms that malarial infection could assume, both in children and adults, were a matter of common knowledge and readily recognized. To the younger generation of medical men, especially those located in the well-populated and well-cultivated States, much of this is only history.

Having had occasion, at one time and another, to meet with some of these peculiar forms of malarial manifestations, it occurred to me that it might be of some interest to put them on record.

I. MALARIAL TORTICOLLIS.

In May, 1874, I was called to see H. S., a boy five years old. He was a small chap, somewhat delicate in appearance, but withal that sturdy enough. Had not had much sickness, as yet. Two days ago his mother suddenly saw that the little boy's head was turned half-way about from right to left, the face looking toward the left shoulder. He could not turn it back to its proper position, and when the mother attempted to do so he cried and said she hurt him. He was in this condition when he went to bed. He slept well, and when he got up in the morning his head was in its natural position. He ate his breakfast and played around till about noon, when he complained of feeling tired and said he would lie down and rest for a little while. About 1 p.m. his mother went into the other room to call him to his dinner, and as she took him up from the sofa she found his head again turned to the left, as it had been yesterday. It remained in that position the rest of the day. He slept well that night, and the next morning his head was again in the usual position. I was called to see him. I found nothing abnormal. He had no temperature. I told the mother I would not prescribe then, but would call and see him in the afternoon. On my second visit I found him with his head turned as described, and very peevish and fretful. Asking him to turn his head back, he began to cry and said he could not do so; that it hurt him to move it.

Taking into account the history, that the child had been well up to a few days ago, that he had never complained of his neck, had no enlarged glands, and the periodicity of the paroxysms, if one may so call them, a feature characteristic of only one form of infection, namely, malaria, a periodicity of which I had been a witness myself, as described, there was but one diagnosis to make, to wit, malaria.

Quinine was ordered to be administered the next morning, two hours, one hour and half an hour before the coming on of the attack (after a method practised by the late Dr. John Davis of Cincinnati). The following day he received the Quinine as directed. About 1:30 p.m. the torticollis again appeared, but was not so severe as the day before; *i. e.*, the head was not turned quite as far to the left, the muscles of the left half of the neck were less tense, and he appeared to have but little discomfort. That night before retiring he was given a dose of Quinine, and the following day three doses, as on the day before. There was no recurrence.

II. DUMB AGUE.

May 10, 1877, Maria M., aet. 10, a well-developed and bright little lady; goes to school. She was brought to the office by her mother, who said that for nearly a week now the child complained every afternoon of her hands and feet being cold. As it was Spring, the weather nice and mild, the mother was rather alarmed.

The little lady said she knew it was always in the afternoon, because it always happened in the afternoon session of the school, about an hour after she had returned there from her dinner. First her toes would get cold, then her fingers. She had no pain, only it was a most uncomfortable sensation. She would get drowsy about the same time, and had difficulty in keeping up with the class exercises.

Asked as to whether the cold travelled up into her legs or her arms, she answered that it did not go up so far, but she was not sure that it did not go into her hands and feet. These also seemed cold. She felt it most, however, in her fingers and her toes. The mother further said that in the hours when she complained the fingers were paler than usual and felt rather cold to her. The parts presented nothing unusual. The child seemed otherwise in good health. A diagnosis of malaria was made, and Quinine medication was prescribed.

A week later, having had occasion to call at the house, the mother informed me that on the second day of the administration of Quinine the trouble disappeared. There was no further recurrence.

This latter form of malarial manifestation was at one time a quite frequent one in adults, and was known to the laity as "Dumb Ague," as my teacher of Materia Medica, Dr. E. B. Stevens, was wont to tell when lecturing on this topic. So far as my experience with children is concerned, it must be of rather rare occurrence with them, as I saw but this one case of this type.

III. SIMULATED SORE THROAT.

September 15, 1878, J. B., aet. 12, a well-grown and well-developed boy; goes to school; has always enjoyed good health, is a hearty eater and sound sleeper. He was brought to the office by his mother, who gave the following history as to his present ailment: The boy had been well up to three days ago; that evening he complained of his throat, said it hurt him. She at once prepared a gargle, and as she thought he had some fever, she also gave him some sweet spirits of Nitre. The next morning he got up at his usual hour, said he was well, ate his breakfast and went to school. At noon he ate his dinner and went back to school. Toward 5 p.m. he again began to complain of his throat; said it hurt him to swallow, and did not eat any supper. He again gargled, took some more Nitre, went to bed, slept all night and woke up in the morning feeling well. The day was a repetition of the day previous. In the evening again the pain. The following morning his mother brought him to the office. He was feeling well and had eaten a hearty breakfast. I looked at his fauces, his tonsils, his pharynx, scanned the cavity of his mouth, but could detect nothing unusual therein. I made pressure on the neck, external to the tonsils, but did not elicit any pain. His temperature was normal. In view of all this I told the mother that I would not prescribe for him now, but would call and see him in the evening. I did so; again examined him as before, but found nothing more than in the morning. His temperature, however, was 101½° F. (in the axilla).

My diagnosis was: Malarial infection. The gargle was stopped and a course of Quinine, beginning with the following morning, was ordered. Four days later the mother reported that the boy was well. There had been no recurrence.

THE YEAR'S PROGRESS IN PEDIATRICS*

By Alfred Friedlander, M.D., of St. Louis, Mo.

Feeding of Infants.—The literature, as usual, has contained a great number of articles on this subject. Comparison of statistics of mortality of breast and hand-fed infants[1] shows that despite the advances in substitute feeding, the artificially fed child is still at an enormous disadvantage. Chapin[2] contributes an interesting article on the influence of breast feeding on the infant's development. The mother's milk is a food that adapts itself to the infant's developing intestinal tract, and so the difficulties in artificial feeding are not merely, as is often assumed, chemical. They are largely due to physiological differences between human and cow's milk. In artificial feeding we must attempt to aid the developmental processes, and so in the art of feeding it is necessary to do more than find a food that will agree. Mere gain in weight is not always a satisfactory criterion. Bunge,[3] as the result of careful analysis of a large series of cases, emphasizes the "hereditary influences" of the inability to nurse. He finds that chronic alcoholism in the antecedents is a potent factor in the production of this inability, which he believes to be steadily on the increase. Levy, in a thesis on Cytoprognosis of Lactation,[4] says that a high proportion of polymorphonuclear neutrophiles in the colostrum (centrifugalized) is a sign that there will be an abundant secretion of milk, while a high percentage of lymphocytes is a bad sign. He advocates the examination of the breast fluid in this way, just before lactation is established, in order to form some idea as to the probability of the mother's being able to nurse.

Artificial Feeding.—The importance of securing clean milk for any system of modification is everywhere insisted upon.[5] [6] Boston has even established a municipal bacterial standard[7] of 500,000 bacteria to the c.c., to which all milk vendors must conform, on penalty of losing the license. While this bacterial standard is much lower than that adopted by the private milk commissions of many cities,[8] it is, nevertheless, a long step forward toward the solution of the question of the control of the milk supply of cities. So far as exact methods of modification are concerned, it is now generally admitted that home modification with milks and creams of known fat strengths is very satisfactory.[9] It is of interest in connection with the question of laboratory modification to note the opinion of one of Germany's leading pediatrists, Stoeltzner, of Berlin. He has this to say, in reviewing an article of Rotch's:[10] "It appears very questionable to the reviewer whether the good results obtained are due essentially, as the American authors would have us believe, to the laboratory modification, *per se.* The dairies, in connection with the laboratories, furnish an extraordinarily clean milk, which can be shipped for great distances without previous sterilization, without deterioration. The use of such milk, without any modification, would probably give excellent results."

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* By courtesy of Interstate Medical Journal.

In an article on "Milk for Infants and Infant Mortality," Behring[11] insists that milk ought to be given to infants raw. The heating of milk destroys the tubercular immune bodies. If raw tubercle-bacilli free milk cannot be obtained, he would advise the addition of formalin to the milk in the proportion of 1 to 10,000. This prevents the multiplication of germs. Experiments on *calves* showed such milk to be absolutely harmless. In view of the attitude of most municipal health boards, who provide punishment for dairymen who formalinize their milk, this view is worthy of note.

Price[12] made a series of experiments on calves to determine the comparative digestibility of raw, pasteurized and sterilized milk. His general conclusion was that the raw milk was much the more digestible. In connection with the question of raw milk it is of interest to note that Halipre[13] insists upon the advantages of clean *raw* milk, from tuberculin tested herds. Coming from a well-known pediatrist of the French school, which has heretofore insisted upon the necessity of absolute *sterilization* of all milk, this must be regarded as a great concession. Backhaus,[14] while admitting that aseptic milking may do away with the necessity for sterilization, believes that ordinarily it would be dangerous to give raw milk. He thinks that pasteurization renders the milk indigestible, and insists upon sterilization to 102° C., the milk to be kept at this temperature for fifteen minutes and then rapidly cooled.

The value of buttermilk as food for infants, previously alluded to in these reviews, is attested by many observers.[15] While it appears to yield particularly good results in the treatment of gastro-enteritis, it may also be used to advantage, at times, in the feeding of healthy infants.

As the result of one hundred experiments on infants from sixteen days to two months old, with reference to starch digestion, Shaw[16] concludes that the saliva of very young infants contains a diastasic enzyme capable of converting small amounts of starch; that this diastasic action may continue in the stomach as long as two hours after feeding; and that on physiological grounds, therefore, there is no reason why infants cannot digest small amounts of starch.

Nobecourt and Vitry,[17] as the result of a series of observations, believe the giving of sodium chloride to poorly nourished breast-fed children to be of distinct value. A decided gain in weight is usually noted. About 1.0 per day, in divided doses, should be given in water before nursing. Poynton[18] has found that the addition of citrate of soda to cow's milk, in substitute feeding, helps to render the curd more easily digestible.

General Hygiene.—The first International Congress for School Hygiene was held at Nurnberg, Germany, in April. Detailed abstract of the transactions is impossible here. Those interested may consult the complete reports in the German pediatric journals.[19] [20] The subject of school hygiene is attracting more attention than ever before. It is gratifying to note that in America the system of medical inspection of schools, which has yielded such excellent results, is being introduced in many of our smaller cities. It is already in vogue in nearly all of the larger ones.[21]

Diseases of the Newly-Born.—Brecelj[22] calls attention to a pseudo-diphtheritic symptom complex often seen in the newly-born. As a result of mechanical irritation there occur small erosions of the mucous membrane of the palate. Secondary infection, with membrane formation and constitutional disturbance, is then common. The picture thus simulates diphtheria very closely. Prophylaxis consists in the avoidance of too much swabbing of the mouth.

Kilmer[23] calls attention to the hematoma of the sternocleidomastoid muscle, caused by injury to that muscle during birth.

The hematomata may occur along the whole length of the muscle, and are often not noticed until some time after birth. A characteristic torticollis makes the diagnosis easy.

SPECIFIC INFECTIOUS DISEASES.

Scarlet Fever.—The question of the specific etiological factor is still under very active discussion. Much literature has appeared concerning the rôle of the streptococcus. Many authors, among them Baginsky, of Berlin, are inclined to believe that scarlet fever is certainly a streptococcus infection, though the actual species has not yet been discovered. Jochmann,[24] however, is of the opinion that streptococci do not play an important rôle in the etiology of scarlet fever, though he admits that streptococcus infection is a frequent and important concomitant of the disease. In the blood of 161 scarlet fever patients, examined early, he found streptococci twenty-five times. Of these, all but one died. Just before death, however, streptococci were found in the blood in at least half the cases. The tonsils are believed to be the port of entry. Streptococci are not believed to stand in causal relation to scarlatinal nephritis. Schamberg and Gildersleeve[25] think that neither strepto- nor the staphylococcus can be looked upon as the specific agent. The diplococcus of Glass was found in only a very small percentage of their cases, and is not regarded as specific. These authors consider that Mallory's find[26] of a protozoan body, the "cyclaster scarlatinalis," is at least very suggestive. This same view finds expression elsewhere.[27] After a series of agglutination tests with the serum of scarlet fever patients, Dopter[28] claims that the non-specificity of the streptococcus is clearly shown. He, too, considers its rôle a purely secondary one.

In the course of an address on scarlet fever, Lauder[29] holds that the infection in scarlet fever is of naso-pharyngeal origin. The rash and the constitutional symptoms are believed to be manifestations of the bacterial toxemia. Acording to this view, the danger of contagion during the period of desquamation has been much exaggerated. His hospital cases are isolated during the early stages, when the naso-pharyngeal infection is at its height. A summary of the cases treated is given, and the original article is worthy of careful reading. Schamberg[30] contributes a valuable paper on the diagnosis of scarlet and scarlatinoid affections, in which the differential diagnosis of obscure and difficult cases is fully discussed. Uffenheimer[31] considers the relation between scarlet and diphtheria. The two diseases often coincide, but scarlatinal infection in diphtheria is much more serious than a diphtheritic complication of scarlet. He believes that tonsilitis in scarlet, *per se,* must be regarded as diphtheritic if Klebs-Loeffler bacilli are found, but thinks that antitoxin should be used in all suspicious cases without awaiting the result of the bacteriological examination. There are, however, unquestionably cases of scarlet, with formation of pharyngeal or laryngeal membrane, without the presence of Klebs-Loeffler bacilli. These are cases of streptococcic infection.

Schmaltz[32] notes the great frequency of complicating myocardial change in scarlet, for which we must constantly be on the lookout. Labbe[33] has made studies of the urine in scarlet and diphtheria. In scarlet there is a diminution in the amount up to the sixth day of the eruption, followed then by an increase. In diphtheria this fluctuation is not so marked. Urobilinuria is rare in scarlet, but is found in 87 per cent, of cases of diphtheria. Contrary to the generally accepted view, the author finds albuminuria to be rare in scarlet, even in the early stages, while it is very common in diphtheria. The diazo reaction is positive in 40 per cent. of the cases of scarlet, always negative in diphtheria.

Various reports on treatment with antistreptococcic sera have been made. Mackie[34] believes the serum to be of distinct value if given early. If, however, the first dose does not have a good effect the continued injection is not apt to be of value. Except for urticarial rashes, he has not seen any ill effects follow the injections. Heubner's impressions[35] in twenty cases are not so favorable. He believes that the treatment should be used only in severe cases, and early. The use of serum is contraindicated when there are multiple foci of streptococcic infection. Existing complications, endocarditis, arthritis, etc., are not affected by its use. Bokay[36] reports twelve cases treated with the Moser serum with good results, and Shaw[37] gives a complete review of Moser's work. With reference to the prophylaxis of scarlatinal nephritis, Buttersack[38] believes that urotropin is of great value. It should be given in appropriate doses, at the outset for three or four days, and again in the third week.

Diphtheria.—Prophylactic injections of antitoxin are lauded by Dubois.[39] Over 700 cases (mostly of acute infectious diseases) were injected. No diphtheria developed, and for the first time in years these wards of the hospital are now free from the disease. Zuppinger[40] reports that of 1,000 patients exposed to diphtheria and treated by prophylactic injections only 18 developed the disease. Of these, 11 had evidently contracted the disease before treatment, as the symptoms developed at once. Concerning these prophylactic injections, Netter [41] made the following statement at the International Congress of Hygiene: At the request of the Paris Pediatric Society over 11,300 prophylactic injections were reported from private and hospital practice. It is concluded that the injections confer an almost complete immunity, beginning twenty-four hours after the injections and lasting a month. All children exposed to diphtheria should receive injections, and in institutions these should be treated monthly, if diphtheria be prevalent, until the epidemic is thoroughly tamped out. The unanimous approval of the congress was had in the matter.

Concerning the bacteriological diagnosis, Czerno-Schwartz[42] says that there are unquestionably non-diphtheritic forms of membranous angina, laryngitis and croup. The presence of the Klebs-Loeffler bacillus, on the other hand, without the clinical symptoms is not enough to warrant the diagnosis of diphtheria. Healthy carriers of bacilli may, however, fall ill at any time, and it is certain that they may carry infection to others.

Methods, value and dangers of intubation are studied by Fischer[43] and Fairbank.[44]

The "accidents" after antitoxin injection have been studied by Coldefy.[45] They consist of fleeting joint and muscular pains and skin eruptions. In tubercular patients a severe febrile reaction may occur. No serious accidents have ever been proved to be actually due to antitoxin.

Comby[46] reports an interesting set of cases of diphtheritic paralyses cured by injections of antitoxin, offering an ingenious theory for its action.

Measles.—Variot[47] calls attention to the difficulty of diagnosis in atypical cases. Koplik spots have been found only rarely in his experience and in that of his colleaguees. A mouth enanthem is, however, nearly always found, and this is a great aid. The rash is sometimes seen earliest in the parotid region. The purpuric form is not rare, and, *per se,* not so very grave. Mueller[48] finds Koplik spots in 80 per cent. of his cases, but they are not pathognomonic, since they have been seen in roetheln. Nadolenczy[49] notes the great frequency of complicating otitis. Ah a rule, though not always, this is benign. It is asserted by other authors, however, that 4 per cent. of deaf-mutism is traceable to measles.

Discussing the relation of measles and tuberculosis, Greze[50] says cases of pre-existent latent tuberculosis are usually aggravated, especially in early childhood, while manifest tuberculosis is always made worse by an attack of measles. Measles does not create tuberculosis, but it prepares the soil by its distinctive lesions and by the genenral weakness which it induces.

Reasoning by analogy from the good effects of the treatment of variola with red light, a number of Spanish clinicians[51] tried the same method in treating measles. They report the procedure as being quite without value, and very disagreeable to the patient besides.

Whooping Cough.—Porak and Durante[52] report an epidemic of pertussis in infants. Of ten cases, varying in age from one to ten months, seven showed pulmonary complications; two had congestion of the lungs; five had broncho-pneumonia. In view of the prevailing opinion of the high mortality of pertussis in very early life, it is noteworthy that *none* of these cases died, despite the complications. For the pertussis proper, treatment consisted in the use of belladonna and grindelia robusta. Eliza Root[53] calls attention to the fact that the mortality from pertussis is nearly as great as that from scarlet. Statistics from nine of the principal cities of the country showed 1,266 deaths from pertussis and 1,457 from scarlet in one year. She urges municipal control of this disease.

Among the therapeutic measures advocated of late by various writers may be mentioned: The use of an elastic abdominal belt by Kilmer,[54] vaporized crude carbolic acid and formaldehyde by Melvin,[55] and cypress of oil (20 per cent. alcoholic solution) poured on the clothes and pillows of the patient.[56]

Typhoid.—Adams[57] gives a resumè of 537 cases seen in childhood in three decades. In half the cases the course is mild. Relapses are common. Intestinal antiseptics are of no benefit. Reliance must be placed on hydrotherapy and good nursing. The mortality, by decades, was reduced from 30.7 per cent. to 11.1

per cent. The average mortality for the series was 14.7 per cent.

Mumps.—Taschner[58] reports a peculiar set of cases. Four members of one family, aged eleven, nine, seven and five years, had mumps. All of these developed endocarditis.

Vaccination.—Goldman[59] has been vaccinating patients under red light and covering the arms with red dressings. He has obtained typical vesicles without the constitutional symptoms which were constant in the control arms. It has been shown that the strength of the virus in the glycerinated vaccine lymph diminishes rather rapidly. Therefore it is suggested[60] to use the lymph at least four weeks old in the first vaccinations so as to prevent too great a reaction, and to use only the freshest lymph for revaccinations.

Tuberculosis.—Behring's pronunciamento that inhalation tuberculosis does not exist, that the primary infection always occurs in infancy and through the gastro-intestinal tract, continues to call forth a great deal of discussion. For a full review of this subject the reader is referred to the department of pathology in this issue. It may be noted here, however, that many observers have published studies tending to controvert absolutely many of Behring's assertions. Thus Reyher[61] shows that Behring's (and Dissa's) statement that the intestinal mucosa in early life is not fully developed is not correct. Fluegge[62] takes strong ground against practically all of Behring's assertions. Speck,[63] basing his conclusions upon carefully compiled statistics, shows that milk infection can only play a small role in the origin of human tuberculosis. Westenhoeffer[64] thinks that infection through milk (and meat) cannot be of very great importance, even though the non-identity of human and bovine tuberculosis is by no means proven. Early childhood, about the time of dentition, is a time of great importance, for the child tends to put everything in the mouth, and infection through inflamed gums may thus easily take place. Cobb[65] thinks that the influence of milk in the spread of tuberculosis has been greatly exaggerated, because in those countries where milk is used but little, or not at all, in infant feeding, and in others where it is always boiled before feeding, tuberculosis is just as prevalent as in countries where it is largely used. Hunter,[66] in 5,142 autopsies in Hongkong, "in a population decimated by tuberculosis," found only twelve cases of intestinal tuberculosis, although 35 per cent. of the autopsies were on children under five years of age. As a result of his studies, Nathan[67] concludes that the view of Baginsky that serous pleurisy does not stand in nearly as close relation to tuberculosis in childhood as it does in adult life is fully justified.

Meningitis.—Squires[68] calls attention to the new diagnostic sign: rhythmic contraction and dilatation of the pupil, frequently present as early as the fourth or fifth day. It is elicited by alternate flexion and extension of the head on the spinal column, with the child in a horizontal position. With reference to Kering's sign, Miller[69] says that it is present in the large majority of cases, though it may appear late. While its presence in suspicious cases speaks for meningitis, its absence, especially in the early stages, does not negate the diagnosis. Koplik[70] says that the Babinski sign is not as common in the epidemic cerebrospinal form as in tubercular meningitis. MacEwing's sign—a hollow percussion note over the anterior horn of the lateral ventricle—is also of more value in the tubercular form. Fundal changes are also more common in this form. Lumbar puncture is not a curative, though it is often a palliative measure, in addition to being of diagnostic value. Huber[71] reports cases of otitis serous meningitis where lumbar puncture appears to be of curative value.

Syphilis.—Franchesini[72] says that histological examination of the cord may give valuable information in doubtful cases, the lesions here being usually restricted to the vessels, and often antedating other luetic lesions by great periods of time. Schwab and Levy[73] consider hypodermic injection the best method of treatment, even at birth. They use an aqueous solution of the biniodide, beginning with ½ milligram doses. Late hereditary syphilis is exhaustively studied by Abt.[74]

Glandular Fever.—Trautman[75] says that this is only a symptomatic expression of infection of the naso-pharynx, of various types, and not a disease *sui generis.*

Erythema Contagiosum.—Under this name Escherich[76] has described an epidemic, contagious erysipelatoid, in the faces of children, subjectively well. The eruption spreads over the body sometimes, may last six to eight days, and is *not* followed by desquamation.

Rheumatism.—Winters[77] is still a believer in the chemical theory of rheumatism, holding that it is caused by non-neutralized products of proteid metabolism. Imperfect oxidation and defective elimination are important factors. Various authors,[78 79 80 81] emphasize the fact that the arthritic manifestations are at a minimum, the cardiac at a maximum, in the rheumatism of childhood. Schaeffer[82] has treated six cases with antistreptococcic serum, with goo dresults.

DISEASES OF THE DIGESTIVE SYSTEM.

Intestinal Autointoxication.—Comby[83] has made a careful study of this condition. In general terms, it may be said that its etiology is to be found in constitutional causes producing either a diminution in the destruction or an increase in the production of enterotoxins. In the diagnosis special stress is to be laid on the urinary examination, an increase in the ethereal sulphates being pathognomonic.

Pyloric Stenosis.—Opinion is still divided as to the relative frequency of true hypertrophic and spasmodic stenosis. The English school [84 85] inclines to the belief that in the great majority of these cases there is a true hypertrophy, only to be relieved by operative interference. Stamm[86] believes that many of these cases depend upon spasm, possibly at least partially induced by the hyperchlorhydria which is so often present. Mery and Guillemot[87] also express skepticism as to the frequency of the true hypertrophic form.

Summer Diarrhea.—The bacteriology of this subject is still being carefully studied. So far as the Shiga bacillus is concerned, it is now settled that it is responsible for a certain percentage of the cases. There are, however, no definite clinical forms of enteritis, and no distinctive pathological lesions which are directly attributable to this group organism.[88 89 90 91 92 93 94] Results of serum treatment have not been very satisfactory.[95] Nobecourt[96] has studied the various forms of streptococcic enteritis. All forms, from simple catarrhal dyspepsia to the fulminating, true septicemic types, may occur. With regard to the edema so often seen, it is to be noted[97 98] that this may occur independently of cardiac or renal lesion, as one manifestation of profound disturbance of metabolism.

Ekiri,[1 TO 99] the discoverer of its specific cause, describes this disease, which is a form of epidermic entero-colitis, very prevalent in Japan.

Tubercular Peritonitis.—Recent evidence[100] [101] [102] tends to show that the results of medical treatment are *better* than those after laparotomy. This procedure should be limited to cases of the caseo-purulent form. In all cases medical treatment along the lines of modern treatment of tuberculosis should be tried first.

Appendicitis.—The difficulties of diagnosis in young children are everywhere alluded to.[103] [104] The objective signs are all important, the subjective symptoms far less so. The general consensus of opinion with regard to treatment is well expressed by the dictum of Brannan: "No cases are operated on too early, many too late." [105] [106]

Epidemic Catarrhal Icterus.—Nicholaysen[107] reports an epidemic of 123 cases, mostly in children. It is regarded as a specific catarrhal affection, directly transmissible from person to person.

DISEASES OF THE RESPIRATORY SYSTEM.

Pneumonia.—Morse[108] says that lobar pneumonia is more common in infancy than is generally supposed, and gives an analysis of 118 cases. The mortality, excluding empyemia, was 23 per cent. The younger the infant the graver the outlook.

Winters[109] thinks that the prognosis of lobar pneumonia in early life is excellent—much better than that of bronchopneumonia. Various authors call attention to the difficulties of diagnosis in early childhood, noting particularly the obscurity of the physical signs. The onset is often marked by intense abdominal pain, simulating that of appendicitis.[110] [111] [112] Northrup[113] has a timely article on treatment, insisting on fresh air, regulation of the bowels, water internally and externally, quiet and rest, and prevention of intestinal fermentation. He does not think that heart stimulation is always necessary; if it be, he relies on whiskey and strychnia. Dessau[114] thinks that as pneumonia is a self-limited infectious process, antiseptic treatment should be employed. For this purpose he uses carbolic acid internally, a drachm of a 2 per cent. solution to a child of three every two hours. He uses hydrotherapy in addition. He reports excellent results.

Empyema.—Ausset[115] calls attention to great frequency of empyema, complicating the pneumonia of childhood. It is often overlooked because of the obscurity of the physical signs. It is always to be looked for in pneumonia with delayed resolution. Prognosis varies with the form, least grave in pneumococcus, always serious in streptococcic and always bad in the tubercular variety.

Enlarged Bronchial Lymph Nodes.—Friedlander[116] discusses the symptoms and physical signs of this very common condition. In ten cases lymphocytosis has been a constant blood find, and this may prove to be a sign of value.

DISEASES OF THE CIRCULATORY SYSTEM.

Acute Infectious Myocarditis.—Forcheimer[117] says that this form of myocardial change is seen most often following diphtheria. Next to diphtheria, the process is seen most often as a result of influenzal septicemia. Pathogenesis, symptoms and treatment are discussed.

DISEASES OF THE URO-GENITAL SYSTEM.

Primary Pyelitis in Infancy.—Hartwig[118] asserts that this condition is not rare; that it often simulates typhoid. In doubtful cases its possible existence should be borne in mind.

Nephritis.—Fry and Martin [119] in urinary examination of 100 infants under three months found albumen in nineteen cases (seventeen of which had casts), while fourteen had casts without albumen. Uric acid was abundant in twenty-six cases, twenty-three of which showed casts. Of these sixteen died under the picture of nephritis. The author regards the association as significant. A summary of existing views of interstitial nephritis in the young is given by Hirsch.[120] Biedert[121] urges routine examination of the urine in all the acute infections, especially bronchopneumonia. Morse[122] reports a series of cases of nephritis from tonsilitis.

Enuresis.—Beilby[123] says that of seventy-five cases carefully studied seventy-one were in boys. In all but four cases masturbation was practiced, a connection noted by Jacobi as long ago as 1876. Ostheimer and Levy[124] report ninety cases. Treatment employed was atropine, corrections of errors of diet, limitation of fluids in the evening and regulation of urinary hyperacidity. Lewis[125] advocates the withholding of all starchy foods at night. Cathelin[126] reports good results from his method of epidural injection, and Kapsammer[127] also reports a series so treated.

Nephrolithiasis.—Mousseaux[128] analyses fifty-seven cases of kidney stone in childhood. No special divergence from the picture as seen in adults is noted.

Diazo Reaction in Childhood.—Fischer[129] says that the reaction is positive in typhoid, acute miliary tuberculosis measles and typhus. In the other acute infections it varies. A negative reaction in the early days of a febrile condition practically excludes typhoid. A positive reaction speaks for the tubercular nature of a pleuritic exudate. A continued positive reaction is a bad prognostic sign in erysipelas anl tuberculosis. A continuance of the reaction after the fifteenth day in typhoid indicates a severe case.

GENERAL DISEASES.

Rickets.—Sobel[130] and Koplik[131] call attention to a sign of rickets (also described by Neurath), viz., a spindle-shaped thickening of the phalanges of the hand. Prechner[132] gives a complete resume of existing views on rickets, with bibliography.

Scurvy.—Rochon[133] believes that scurvy is on the increase in France. The almost universal practice of sterilization of milk is probably responsible for this, for prolonged sterilization certainly diminishes the soluble phosphates and citric acid, and destroys the ferments. Breast feeding and feeding of raw milk were not causal factors in any of the forty-three cases studied. Morse[134] reports a number of cases in which hematuria was the earliest or only symptom of scurvy in infants. He says that scurvy is the most common cause of uncomplicated hematuria in infancy.

Lendorff[135] calls attention to the value of the X-ray to clear up the diagnosis in obscure, doubtful cases.

The most important larger work on pediatrics issued during the year is the second edition of Grancher and Comby's "Traite des Maladies de l'Enfance." Four of the five volumes have already appeared, and this international cyclopedia may fitly be said to be an epitome of the pediatric thought of to-day.

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SOME IMPORTANT PSYCHO-NEUROSES OF CHILDHOOD.*

By Prof. A. Pick, of Prague.

In this address much attention is devoted to certain psycho-neuroses of childhood, viz., "running away from school," "tics," imperative ideas (or uncontrollable and frequently recurring thoughts), morbid scrupulosity and hallucinations. The address is worthy the careful consideration of teachers and physicians, but it is to be hoped that it will not fall into the hands of German and Austrian schoolboys.

It has long been recognized that "running away from school" is not always due to laziness or other moral defects. In some cases the cause is really a form of epilepsy—petit mal, in others hysteria; but in the majority of cases there is an impulse to rambling, which is due to mental asthenia.

The children affected with this neurosis suffer from almost uncontrollable restlessness and impulses to ramble (in the open-air, in the fields or forest), which are excited by every displeasure, by the fear of school lessons, or of punishment. Such children often leave home from slight and trivial causes, disappear for several days, and are found again half starved.

In the rare cases of epileptic nature, treatment by bromides is indicated; in the hysterical cases suggestion ("watch" suggestion) is worthy of trial. But in the usual forms, due to mental asthenia, the chief indication is to prevent the bad temper and bad humor of the children. Everything tending to promote and maintain evenness and uniformity of temper and disposition is of service in checking this neurosis.

It is important to endeavor to promote a cheerful disposition and temper in these children, not only on account of the neurosis under consideration, but also because cheerfulness and contentment are "exquisite tonics." Other points of importance are the training to bear pain and to become accustomed to the feelings of displeasure, and the prevention of mental irritation and excitement. Pick mentions that he has seen this neurosis only in male children, and that it is more frequent among the children of the poor than of the wealthy. In the case of poor town children treatment in a special institution may be necessary. The correction of this neurosis is important because, if unchecked, the children may grow up into criminal vagabonds.

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* Address given at the Vienna "Verein f. Psychiatrie und Neurologie," Jan. 13, 1904.

More important than the neurosis just described are imperative ideas and thoughts. Not infrequently this neurosis is associated with excessive or morbid punctuality and scrupulosity, with fear and anxiety. The symptoms in several cases of this neurosis were given in the address. In the treatment of such cases outdoor games and handwork are useful; cessation of school work, alteration of mode of life, etc., may be advisable.

Habit spasms, habit chorea, or "tics," are frequently associated with the neurosis just mentioned. For the treatment of these conditions over-feeding, avoidance of overstrain (especially through school work), certain gymnastic exercises, and liquor arsenicalis are recommended. A symptom similar to "tic" in its nature is great general restlessness.

The hallucinations sometime met with in school children are also considered, and illustrations given.

The address is concluded with some valuable general remarks on education and neurosis.

Prof. Pick thinks that it is a great mistake to attempt to destroy all forms of phantasy in children; and he regards it as a modern failing that through an over-estimation of the intellectual side of the mind, too little importance is attached to phantasy and feeling. But he admits, of course, that differences in the mode of education and training may be necessary, according to the disposition of the child.

The present generation is justly described as nervous or neurotic. But Prof. Pick points out, that if all which has been described in popular and scientific works as neurotic, nervous and mentally pathological, be admitted as real evidence of diseased or abnormal mental conditions, then we must regard as pathological all that we are accustomed to consider as the "bloom" of humanity. Every deviation or mental peculiarity should not be regarded as a sign of degeneration. A sharp distinction should be made between mental deviations in an upward direction, and deviations which are deteriorations.

Neurosis in the pathological sense should be distinguished from the normal advancing nervous life of the present day; and as much attention should be devoted to the preservation of this normal nervousness or neurosis as to the combatting of the true pathological neurosis.

In recent years all, or at least the greater part of the neurosis of children has been attributed to mental overstrain at school. But Pick believes that neurosis in children is caused by injurious influences acting on the emotional side of the mind, or to such influences associated with others of an intellectual form. He thinks, that apart from heredity and imitation, it is especially influences acting injuriously on the senses and the emotions of town children, at the age before school attendance, which form the foundation of neurosis; and that the condition is fully developed during school life, especially through emotional causes, of which he regards excessive ambition as particularly injurious. Hence it is at the period of child life before school attendance is commenced that special attention should be devoted to the prevention of neurosis. This is the age at which the foundations of character are laid; and the more we are convinced that it is individuality of *character, and not knowledge, which is power,* the more will attention be devoted to the education of the emotional side of the mind. Prof. Pick points out, that with these views we return to opinions of the older psychologists—that the sphere of feeling is the foundation of the human mental life. Prof. Pick in this address strongly opposes, from the standpoint of the neurologist, the views of those who would limit education merely to the training of the intellect.

[The formation of character and ethical training have for ages been regarded by some of the ablest teachers as the most important objects of education in its best sense. In recent years these views have been especially urged by Prof. Rein, of Jena. They were clearly put forward by him in his admirable "Warburton Lectures" at the Victoria University of Manchester (June, 1904). At the present time, in England, they are not the popular opinions as to the chief object of education, and certainly not the views of a large number of scientific and medical men; but they are supported, from the medical standpoint, by certain able English and German neurologists.]

PHYSIOLOGICAL THERAPEUTICS VERSUS DRUGS IN THE TREATMENT OF DISEASES OF INFANCY AND CHILDHOOD.

By J. Morton Howell, A.M., M.D.,

OF DAYTON, OHIO.

The means of accomplishing therapeutic ends has been properly divided into two classes or categories, viz., natural and artificial.

Of the latter class is understood the introduction into the system of substances or drugs which have for their object the counteracting of poison, elimination of morbific matter, supply of elements to the organism, which by reason of the disease have become defective or absent, etc., and thus modify the recuperative process.

By natural or physiological therapeutics we understand the utilization in the management of the sick of agencies similar to those constantly acting upon the human body in health, but because of some departure in health, needing to be especially curtailed, exaggerated, generalized, or localized in their action.

There is no room in discussing physiological therapeutics to admit osteopathy, Christian science, Dowieism, or any of these fads which range outside of regular medicine. They are "isms," without a particle of virtue which has not long since been recognized and practiced by well-informed regular practitioners.

The osteopathic idea is, or was, that all diseases, or nearly all, are the result of displacement of bones, which, thus displaced, press upon various nerves and organs, and so give rise to manifold and varied symptoms.

The only real virtue that is or can be afforded by this so-called school is that of massage and suggestion, and I feel loath to let two such valuable therapeutic measures as these suffer by such association. They deserve better company. The very fact that the founders and writers of this "ism" put aside as useless material all physiology, pathology, etiology, physical diagnosis, except what they pretend to learn by touch, and throw aside as unworthy of their thought or attention bacteriology, chemistry, and the normal and abnormal functions of the organs of digestion and assimilation, brands their one idea as unworthy of consideration.

As to the individuals practicing these fads, they might well be dismissed with the plain statement of a scientifically demonstrated fact, that they are but excrescences upon the "body politic," if not vipers feeding upon the vitals of humanity.

The object of this paper is not to decry the proper use of artificial therapeutics, as defined, but more properly to call attention to the somewhat overlooked fact that the "normal organism has within it, to a high degree, the power of self-recuperation and adjustment," and to insist that it is due nature and nature's creator that they be given the most favorable opportunity of asserting their power and function.

Life, according to Herbert Spencer, is characterized by the power of living beings to preserve a mobile equilibrium within their environments, or, as he phrases it, by the continuous adjustment of internal relations.

Disease, then, is the unbalancing of this equilibrium, and so throwing the organism out of adjustment, that unless corrected soon some part of the necessary anatomical structure will be irreparably damaged, which means sooner or later death of the whole.

Solomon Solis-Cohen has well said: "We must recognize that disease and recovery are alike vital processes, in which the organism itself is the most active agent, and that neither morbific nor therapeutic influence endow the organism with new attributes or introduce into its operations new powers; but we must also keep in mind that disease and recovery are often one continuous process."

I am a firm believer in the use of drugs properly selected, correctly and thoughtfully administered; but that great harm has been and is being done by their indiscriminate selection and use there is no room to question.

Physicians who have crowded waiting-rooms, and who dispense their own drugs, are especially prone to haphazard drug giving. Their best judgment is not always in the ascendency.

They go from their patients to the medicine shelf, to prepare their own compounds or the compounds of the already too numerous "physicians' supply companies," and if their special mixture which they had in mind originally is exhausted another is substituted. This done, they come back to their patients with the remedy

(?) and directions, and the patient is dismissed without a word probably as to diet and hygiene.

I submit to you, gentlemen, that it is not the function of a physician to act as druggist and physician at one and the same time.

If drugs are found indicated, after a careful subjective and objective examination of your patient, then turn thoughtfully to your desk and write a prescription for just what is indicated, regardless of cost.

Explain to your patient, or to the parents, if patient be a child, that the medicine, while indicated and much needed, is but an adjuvant to assist in recovery, and that *more* important than the medicine is the careful carrying out of the directions as to diet, hygiene, etc., etc., which you are now about to outline.

The "fundamental principle" of L. Emmet Holt, in his "Infancy and Childhood," should never be lost sight of, viz., never give a dose of medicine without a clear and definite indication." And his further words will be found true along this line, viz., "and you will be surprised to find how often medication can be dispensed with, and also how much better children do without drugs than with them."

Let your diagnosis be so satisfactory to yourself that when you have outlined the treatment to be carried out you shall not need to make use of the old (but ought to be obsolete) saying, "if you are not better within a few days, let me hear from you."

Have clear-cut views as to the needs of your patient, make it *clear to them.* Be precise as to future appointments, and you will not only be pleased to note improvement in your patients, but will thereby secure their confidence and esteem, and that of their friends also.

Patients, I have found, appreciate your interest in them, and I have observed that they are appreciative in a most *substantial way* of the necessary time and interest devoted to their welfare.

Let me here insist on sufficient time for a thorough examination, whether at home or office. Do not fear that your patients in the waiting-room will become weary in waiting and leave for some one who is less busy. They are not looking for such.

When contemplating our dependence upon nature for adjustment of difference between pathology and physiology, many cases present themselves to our mind. One which was the center of attraction to the entire medical world a few years ago—that of the late President McKinley—may be referred to. The despatch with which the operation was done, its technique, the subsequent care and treatment of the patient, reflect, in the light of a critical post-mortem examination, credit upon the surgeons connected with the case. Their splendid efforts deserved better success. The prognosis, you will remember, was most optimistic, especially by the leading counsel, the great and beloved McBurney. Their inability to crown their labor with success lay in the fact that the "organism," "the most active agent," had been paralyzed from the start, beyond the skill of human hands to vitalize.

I well remember my good professor in materia medica and therapeutics and some of his lectures; it seems I can recall almost *verbatim* some of them. How he did extol ipecacuanha, digitalis, belladonna, and the host of other long-used and well-known drugs! I remember that the virtues which he ascribed to ipecac made me feel that with that drug alone I should be fairly well armed to cope with disease.

Ipecac is said to be indicated in acute indigestion, bilious sick headache, in the commencement of eruptive, continued and periodical fevers; but those of us who have not found out by experience that, given in doses sufficiently large to produce these so-called beneficial results, are admonished by those who have had such experience that they sometimes produce, instead of beneficial results, irritation and inflammation of the intestinal canal, hemoptysis and other hemorrhages. Experience has taught me that much superior agents are found in gastric lavage and enemas. These agents have the advantage of being absolutely void of risk or danger, and may be used with positive assurance that results most satisfactory will follow their intelligent use. The indications for their administration cover all those mentioned in connection with ipecac and many more.

Gastric lavage in the treatment of acute indigestion, acute gastritis, chronic indigestion and in gastro-intestinal infection or cholera infantum is well-nigh indispensable. It is useful in dilation of the stomach, in which delayed and impaired digestion, with retention and fermentation of the contents of the viscus, gives rise to distressing symptoms.

In intestinal obstruction, strangulated hernia, it should be employed as a preliminary to surgical operation to rid the stomach of all undigested matter, and thereby render vomiting less liable to occur. For by this distressing symptom alone sometimes the result of a brilliant operation has been rendered futile.

Antiphlogistics—aconite, veratrum viride, gelsemium, ergot, digitalis, all more or less dangerous and uncertain in their action when active, and most highly disappointing when found inert—happily for patients and creditably for physicians, are rapidly falling into disuse and their place is filled by graduated bath, cold tub-bath, sheet-bath, ablution or sponging.

Diaphoretics and sudorifics are frequently called into use by attacks of influenza, coryza, congestions of bronchi and lungs and in acute, subacute and chronic nephritis.

Prominent in this list may be named Dover's poyder. Its virtue (such as it has) is found in the opium which it contains, reducing the circulation, togther with the ipecacuanha, which produces relaxation and dilation of the superficial capillaries.

If any valuable therapeutic end is accomplished by this drug, is it not most reasonable to expect that it will be done at the expense of other organs which very much need be conserved?

The same end, we think, may be accomplished, with no risk or danger to any other part of the organism, by the hot bath, followed by wrapping in warm blankets (hot packs), Turkish and saline baths and dry heat.

Cathartics, or remedies for the relief and cure of constipation, are many, and some of them are valuable adjuvants in the relief of this much-found condition. None, however, can be said to be curative.

The etiology for the most part is due to improper feeding and defective habits. In every case, however, the cause should be ascertained. The therapeutic agent or agents for its relief and cure must be in the great majority of cases persisted in for some time. For instance, the mother or nurse complains that the child is constipated and that drugs or mechanical aid must be used to secure every evacuation; in such cases, in the majority of instances, you will find defective dietation. With infants and younger children too much solids and insufficient fats; too little fluids may be drunk. Again, it may be due to a diminution of intestinal secretions and weakness of the intestinal muscles; when the cause is ascertained, then we can intelligently proceed to its removal. Those in charge of infants and children must be impressed with the importance of specific hours for attention to the calls of nature.

Habit, dietation, massage, hydrotherapy, cold wet packs and cold spray upon the abdomen is the treatment *par excellence.* It must be explained that these measures in persistent cases may not yield success in a few days, or even a few weeks, but that they must be religiously persisted in until success is attained.

I should like to pursue at further length this comparison between physiologic and drug therapeutics. Time will not permit me to do so.

Mechano-therapy especially deserves our most careful attention. What a well-appointed gymnasium alone is doing to-day for young manhood and womanhood, both as a prophylactic and curative measure, is marvelously good. Such institutions as the Y.M.C.A., with the gymnasiums, should receive the strong support of both physician and layman.

Pneumo-therapy, with its many and varied therapeutic virtues; photo-therapy, which is now an established product of the twentieth century, together with the splendid results that come from rest, and mental therapeutics, deserve our attention in our contests with disease.

As my subject has particularly to do with therapeutics peculiar to infancy and childhood, let us look at some of the more prominent diseases, with which we have to deal.

Diseases may properly be divided into two general classes—hereditary and acquired. While the two are inseparable in some instances, yet, for the sake of convenience, and fact, they may be so classed.

The two hereditary diseases which concern us most are syphilis and tuberculosis. Of the former little can be done which will prove satisfactory to either patient or physician. That tuberculosis can be inherited from either the father or mother, or both, there is now no room to question. Intrauterine infection must, however, be considered rare, in comparison with the frequency with which infection takes place after birth.

The treatment of tuberculosis in infancy and childhood is, or should be, pre-eminently physiologic. Before speaking directly upon the treatment, I wish to make a little digression in reference to prophylaxis.

It manifestly subjects an infant to great risk who is attended by a nurse who suffers from tuberculosis, and we should be most particular that those selected to wait upon expectant mothers, and who are elected to attend the babes also, are free from such disease.

Children particularly should not be allowed to visit rooms of patients whose inmates are known to be suffering from tuberculosis. Holt cites an instance of two little girls (both strong and healthy, no vitiated tendency) being allowed to visit frequently a young woman who was suffering from pulmonary tuberculosis. Within three months of that time, and within six weeks of each other, both died of tuberculosis meningitis.

Reich, in 1878, reported a very striking instance of direct infection: "In a town of 1300 inhabitants, the obstetric practice was divided between two midwives. Within fourteen months no less than ten infants, who had been delivered by one of these women, died of tuberculous meningitis. In none of these families was there a history of tuberculosis. This midwife was found to be suffering from tuberculosis and died from that disease. It was the custom of both nurses to remove the mucus from the mouth of the newly born, by direct mouth-to-mouth aspiration, and then to establish respiration by blowing into the nose. There were no cases of tuberculosis in the practice of the nurse free from disease."

To recapitulate somewhat, a healthy born child, with no inherited or vitiated tendency, should be surrounded from the very start by an environment that is conducive to continued good health. This means an intelligent, healthy nurse, a mother who furnishes sufficient nourishment for the satisfaction, growth and development of the child. Or, unable to do this, pabulum furnished from cow's milk, which will be in proper chemical conformity with ideal mother's milk; regular intelligent feeding, bathing, a nursery that admits plenty of sunshine and fresh pure air.

The treatment I have outlined requisite for the maintenance of health in a healthy child free from hereditary taints, is the treatment *par excellence* for a child also with less fortunate inheritance, as what is requisite here is to guard against the inroads of disease by building up an organism that will be invulnerable.

It is true, I think, that those children who are predisposed to tuberculosis are especially prone to suffer from disease of the nose and throat—enlarged tonsils, adenoids, polypi, etc. This condition should receive prompt surgical attention. The nose and throat should be kept free from mucus and crust, and thus keep or render the mucous membrane healthy.

Let us now consider briefly some of the acquired diseases which confront us. First, those of derangement of nutrition; such derangement may properly be divided into: Cases of acute inanition, cases of mal-nutrition and cases of marasmus. They differ in degree rather than kind. The etiology is for the most part the same—improper feeding, and crowded, badly ventilated apartments.

Statistics show that fully one-half of the deaths are due directly or indirectly to marasmus, which is the severe form of mal-nutrition seen in infancy. It is a difficult problem, with the most approved methods of artificial feeding, in some cases of mal-nutrition to establish an "equilibrium." This is especially true in institutions lacking adequate space for each child, which should be at least 800 cubic feet. While those cases in the smaller towns and cities are not seen so frequently as in the crowded tenement districts of the larger cities, yet they are here, too, frequently seen.

Treatment.—Wet nursing, approved artificial feeding, bodies and extremities kept warm with proper clothing, while the patient is admitted (both by day and night) to fresh air and plenty of room. Bathing should not be lost sight of, hot and cold, the cold especially when reaction from such bath is satisfactory. Pepsin, iron, cod-liver oil, strychnine—in fact, all drugs—are worse than useless.

Children who have been victims of faulty nutrition and apparently recover need be further watched for the development of the sequelæ—scorbutus and rickets. Right here I desire to say a word regarding the diagnosis of both these diseases. It is not necessary that you have a child who is "old, and anemic in looks, with wrinkled skin, large eyes, prominent abdomen, hollow temples, hands resembling bird claws and with drum-stick legs," to diagnose scorbutus or rickets, but, on the other hand, they may in appearance look the picture of health.

Holt records a mild type of scorbutus in a child nine months old, who, to all outward appearance, was in perfect health. "He was first noticed to cry out sharply as if in pain when lifted in a certain way. It soon became evident that the trouble was located about the left knee. Nothing could be discovered upon examination except a very great amount of tenderness. This symptom continued for six weeks; on some days the tenderness was extremely acute, and on others scarcely noticeable. After three weeks a slight ecchymosis was discovered over the head of the tibia of the affected limb. About this time the tenderness and disinclination to move the shoulder was noticed, and soon an ecchymosis like a small bruise was seen in front of the shoulder joint. These symptoms were sufficient for a diagnosis of scurvy. The diet was proprietary foods with milk and beef juice. The infant food was discontinued and milk and beef juice increased, with disappearance of all symptoms of disease within a few days."

Proprietary foods as the principal article of diet are never to be recommended. You may be able to see every day in your practice babies like the one referrd to by Holt, *apparently* in perfect health, but whose very foundation for continued health and existence is being undermined by these foods, which are rich for the most part in carbohydrates only. A child who has inherited a "tendency to health" and who lives in the country with good surroundings, may run the gauntlet successfully, fed upon proprietary foods, but the chances with even such surroundings are most decidedly against it.

Rickets develops between the ages of six months and two and a half years, and it is but a chronic condition of nutrition demanding for its cure physiologic therapeutics only.

Stomatitis (except specific class) is due to traumatism and faulty nutrition, and requires for its cure cleanliness and improved nutrition.

Dentition is belived by some writers on pediatrics to be a simple normal condition, requiring but little consideration from the physician. But within the past two years I have had at least three cases in which the symptoms were alarming.

Ruth E., six months old, a splendidly developed child of good parentage; artificially fed, with perfect agreement, as evidenced by normal growth and weight, quiet, undisturbed sleep, normal action of the bowels, both as regards frequency and color; developed fretfulness and an alarming pyrexia. In connection with the symptoms just narrated I found her with tense, swollen gums and constipated bowels. There had been no convulsions, but she would awaken from sleep with a start and cry that indicated a condition not far removed from convulsions. Her fever at the time of my first visit was 105°, and with the graduated bath which I ordered, together with enema, the temperature was reduced satisfactorily, but by night it was 106°. The baths were continued sufficiently often to control the fever, and as many as five were given in twenty-four hours. The gums were scarified on the second day, but the fever and restlessness continued more or less for eight days. The food was reduced to one-fourth the amount ordinarily given and an abundance of fresh, pure water was given instead.

The other two cases presented were like the one just reported in being artificially fed—tense, swollen gums, fretfulness and high fever—and differed in the following points: One of the two patients was twelve months old, and had vomiting and convulsions. The other child was twenty months old and had vomiting, no convulsions.

The treatment of the patients was practically the same—scarifying gums, reduction of food, graduated baths. The one having convulsions was given in connection with treatment outlined, ice-cap to head, and hot mustard foot baths. All made satisfactory recoveries.

The armamentarium necessary for the successful treatment of acute gastritis, gastro-duodenitis, chronic gastric indigestion, acute and chronic intestinal indigestion, consists in diet, lavages, enemata, cold and hot packs, graduated baths, fresh air and sunlight. In fact, intelligent use of the means suggested will avail in all diseases, of whatsoever kind, of the intestinal tract that are amenable to so-called medicinal treatment.

I am not unmindful of the almost marvelous effects of the thyroid extract in myxedematous idiocy, or of the transforming powers of mercury and iodide of potassium in "specific diseases"; of the melting power of the antitoxitive serum on the terrific membrane caused by the Klebs-Loefler bacillus when admitted to the circulation, or of the fleeing plasmodium of Laveran when pursued by quinine. But let us not lose sight of the "fundamental principle" of Holt—never to give a dose of medicine without a clear and definite indication.

CHRONIC INTESTINAL DYSPEPSIA OF CHILDREN

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(*Continued from last month*)

Irregularity of the bowels, though, unlike the above symptoms not a constant feature of the disease, is nevertheless very frequently observed. In only eighteen of the cases was it said that the evacuations were neither constipated nor diarrheic. Twelve cases were constipated, six were inclined to be constipated, seven alternated between constipation and diarrhea, and four between diarrhea and regularity. Two children suffered from lienteric diarrhea, and one generally had several loose motions after going to school. Patients in the class from which these statistics are compiled are apt to think that a slight degree of constipation is the normal condition of health, and it was necessary to guard against this source of error by asking definitely how often the bowels moved, and inquiring into the nature of the motions, otherwise several cases which were really constipated would have been classed as regular. Contrary to the description given by Holt,[18] and by Rotch,[19] the motions were generally said to appear quite normal. In only one case were they stated to be of a greyish color, in two it was said that they were very dark, and several mothers remarked that they were very offensive. The above figures show us that constipation is frequent, but is by no means the *fons et origo mali* that it is accused of being by so many observers. Those cases of alternating constipation and diarrhea are typical of the patients in whom there are recurrent attacks of—

Gastric fever, which it may be well here to consider. A typical case of the severest form was that of William K., aged 9, who every three weeks had attacks of headache, vomiting, and diarrhea. During the attacks he was acutely ill, the tongue was dry and furred, the temperature was high, and he was delirious. He had a severe pain in the epigastrium, and wetted the bed when asleep. He had almost complete anorexia. This acute illness lasted for three or four days, and then all the symptoms subsided, and for a few days he was much better than prior to the attack. The diarrhea stopped and constipation took its place, his appetite then became ravenous, and his mother stated that "it is almost impossible to satisfy him." After a week or so the symptoms of chronic intestinal dyspepsia gradually became more marked again, and slowly increased in severity till they culminated in another acute attack. Six of the children in the series of fifty had attacks similar to this, though the seizures were not generally so frequent as in the case cited, and in some the symptoms were less severe and the duration was longer. It was rare that the mother could assign any definite cause for the onset of the attack. In at least nine other cases there were "bilious attacks" which resembled the above in character, but were not so severe, and some of the mildest consisted only in attacks of vomiting and severe headache. Even in the cases of gastric fever there was no definite jaundice, though there was generally a slight icteric tinge.

It is seen that the symptoms of these acute attacks are very similar to those of appendicitis, and, without very careful physical examination, may lead one to a wrong diagnosis. When the vomiting is not a prominent symptom in the attacks, one may at first think of enteric fever, but the previous history of the child, especially the history of former attacks of a similar nature, ought to prevent the physician from being misled. They also closely resemble, and in some cases may really be, severe attacks of megrim.

Jaundice.—There was a history of an attack of catarrhal jaundice in six of the cases.

Vomiting was noted as a symptom only in the above fifteen cases, and in three others in which it occurred in the morning, shortly after getting up. Five other children occasionally complained of nausea, and in two the food "repeated."

Flatulence is only rarely complained of.

An excess of mucus in the motions.—The symptom on which

Eustace Smith[2] lays so much stress was observed in not quite half the cases. In thirty of the children it was said either that slime was not present or that it had not been observed. In five it was only rarely seen, in three it was noticed when there were attacks of diarrhea, and in twelve it was frequently observed. It is probable that in some of the cases an excess of mucus might be present in the stools without the mothers being aware of the fact, but in these instances the children were generally old enough to be interrogated on the point themselves; and, on the other hand, some of the cases in which a certain amount of slime had occasionally been noticed, might not really be producing a pathological amount of that lubricant, so that, on the whole, the figures given are probably fairly accurate. The character of the mucus varied in the different cases, and was described as "thick white," "thick yellowy," "greeny yellow," or "brown," or as "like phlegm," or "pieces of slime." This excess of mucus, as one would expect, was present much more frequently when there was constipation or diarrhea than when the bowels were regular. In one instance, in which there was much mucus in the stools, it was also observed in excess in the vomited matter.

Intestinal parasites.—Intestinal worms are very frequently found in cases of chronic intestinal dyspepsia, and the figures of the fifty cases under consideration are probably lower than the average. The figures are—in three cases tape-worms had been seen, in two the *Ascaris lumbricoides*, and in six cases thread-worms were present at the time of examination. In nine other children thread-worms had formerly been present, but had been got rid of; they were still present in only one child above seven years of age. Before intestinal worms can flourish there must probably always be a predisposing, as well as the exciting cause, and the condition of the bowel in chronic intestinal dyspepsia admirably suits the growth of the parasites. Their presence in the intestine, therefore, is to be considered much more as a symptom than as a disease, and many of the symptoms ascribed to worms are really due to the disease which allows of their existence. Contrary to what one might expect, there appeared to be no close relationship between the presence of an excess of mucus and of worms.

Attacks of pallor.—The presence of this symptom was inquired into only in twenty-two of the cases. Seventeen of the children were said by their mothers frequently to "come over white." In the remaining five this had not been observed. A description, typical of many of the others, was given by the mother of Eva B., aged four and one-half years, who said that her daughter "changes" about six times a day, all her face becomes yellow, except round the eyes, where the color is almost black. She feels faint, and cannot stand whilst the attack is on; it lasts about ten minutes. Some of the children actually faint in these attacks, but this is quite the exception. Exertion, epigastric pain, and emotion were said sometimes to produce these attacks, but most frequently they came on without any apparent cause. It is unfortunate that the presence, or absence, of this symptom was not inquired into in every case; as far as the statistics go, they seem to show that there is a relationship between the condition and the presence of worms. In nine of the seventeen cases who "came over white," there was a history of intestinal parasites (including the three cases of tape-worms and one of the two cases of round-worms), and of the five who did not have attacks of pallor, only one had (thread) worms.

Cold hands and feet.—In most of the cases, the mothers stated that the extremities were generally cold. The occurrence of cold hands and feet generally means a diminished blood supply to these parts, and consequently more or less congestion of the internal organs. That this symptom may tend to prolong the disease is, as Eustace Smith says, very probable.

Stammering, aphasia, and asthma after meals have all been described as occurring in chronic intestinal dyspepsia of children, but were not found in any of the fifty cases under consideration. The question of masturbation was not inquired into; in no case was it mentioned as having been observed by the parents.

Physical Examination.—*Facies.*—The typical facial appearance, as my notes show, is a pale and sallow complexion, dark rings round the eyes, and an appearance of great tiredness. If the child is excited, however, his face will readily flush, and for a few minutes he will, to superficial observation, appear bright and well. The nutrition of the face appears very rarely to suffer so much as that of the trunk and extremities, and, as a consequence, in none of the cases was the face noted as being very thin; the faces of nine of the children, on the other hand, were described as fairly fat and well nourished. Twelve of the children were said to have an "adenoid" appearance; two were put down as typically tuberculous looking.

Nutrition.—The nutrition in three cases was described as "fair," in three as moderate, thirty-seven children were said to be thin, and seven very thin. In no cases, however, was there actual emaciation; and, on the other hand, probably in no case did the nutrition reach the normal standard. The muscles felt soft and flabby to the grasp. The younger children were, as a rule, better nourished than were those a few years older. Sixteen of the children were weighed; the following table gives the particulars:—

		Age.		Weight.		Difference in Weight from Average Child of same Sex and Age.*
Initials.	Sex.	Years.	Months.	Stones.	Lbs.	Lbs.
E. J.	Girl	4	0	2	6	+ 4
F. D.	Boy	4	6	1	12¾	— 7
P. C.	Boy	4	9	2	5½	— ½
C. H.	Boy	5	7	2	5½	— 2
H. D.	Girl	5	9	2	4¼	— 3
L. H.	Girl	6	4	2	8	— 1
A. L.	Boy	6	3	2	10½	— ¾
R. C.	Girl	6	3	2	¾	— 7½
S. A.	Boy	7	6	2	11½	— 5
W. W.	Boy	8	6	2	9¾	— 12
W. K.	Boy	9	0	3	4¼	— 5
E. P.	Girl	10	6	3	11	— 2
T. H.	Boy	11	1	3	12¼	— 6¾
A. G.	Boy	11	7	3	10	— 13
W. W.	Boy	12	0	3	9¾	— 15
H. S.	Boy	12	6	4	8½	— 2½

Skin.—In a great number of the cases there was a certain amount of harshness of the skin, though it never reached the degree so typically seen in advanced tuberculous disease. Three of the patients had eczema. The complexion was generally sallow.

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* The average weights are taken from Treves' "Physical Education" (20), p. 6, Table I. The average weights in the table are given for each year of age, and the age of the child is put down as its age at last birthday; I have added on half a year, therefore, as representing the average, and have based my calculations for the special month required for this assumption. My cases were weighed nude; I have calculated the clothes as one-eighth the body-weight.

Conjunctivæ.—There was generally a slight degree of anemia; in only four cases was the anemia pronounced. At the time of examination, the conjunctivæ of none of the children showed a definite icterus.

Teeth.—In only eight cases were there no carious teeth; each child, on an average, had three teeth with cavities.

Tongue.—The condition of the tongue was found to be very variable, and presented no constant features. There were two types, however, which were fairly frequent. In the first, the back of the tongue was rather thickly coated with a whitish yellow fur, whilst the rest of the organ was fairly clean, but was covered with a layer of saliva, which Eustace Smith[2] aptly likens to a coating of gum. This "gummy" appearance of the tongue is due to an excess of mucus in the saliva, and consequently, before it can be seen, the dorsum of the tongue must be quite wet. It will not be observed, therefore, if the child has just swallowed, or been doing much talking immediately prior to inspection. One may see a case in which the condition is typically present, but on looking at the tongue again after a lapse of a couple of minutes the gummy appearance has quite disappeared. Whilst this condition was fairly frequently observed, it was only very rarely as typically seen as it is in any severe case of pertussis.

The second type of tongue was that in which the mucous membrane of the entire dorsum had a whitish, sodden appearance, as if it had been steeped in some alkali, and in which the fungiform papillæ stood prominently out from this white background as raised, bright, pink prominences.

My notes show that in the majority of cases these two types were distinct, though in many cases they merged into one another, and some of the characteristics of one type were combined with those of the other. As might be expected, the "gummy" tongue was more frequently observed in those cases in which mucus occurred in the stools.

Palate.—The majority of cases had palates which were higher and narrower than normal; this was especially noticed in those patients who had adenoid growths in the naso-pharynx. In one case only was the palate deformed.

Throat.—More or less chronic pharyngitis was almost constantly present, and there was enlargement of tonsils or adenoid growths in twenty-nine of the cases. Of these twenty-nine cases five had pigeon-breast, and two others had also deformed chests. Most of the text-books give a long list of "reflex symptoms" of adenoids and enlarged tonsils." As we have already seen, several of the other signs and symptoms of chronic intestinal dyspepsia of children are produced or exaggerated by their presence; but from the fact of so many children having the disease without their presence, we may at once conclude that they are not the origin of the trouble. If further proof were needed, one might mention two children in my series of fifty cases, in whom the tonsils and adenoids had been removed and had not recurred, one 1, and one 3 years previous to examination, but in whom the usual signs and symptoms of chronic intestinal dyspepsia were typically present.

Heart.—As formerly stated, no children with distinct *morbus cordis* were included in the series of cases. In four of the cases there was some systolic impurity at the apex of the heart, but in none of them did there appear to be any organic valvular lesion. The pulse of another of the children was very irregular; in this case, too, there was no organic cardiac disease.

Abdomen.—In only six cases was there "pot-belly"; in five out of these six cases there was either diarrhea or alternating diarrhea and constipation. The prominence of the abdomen in all these cases was due to excessive flatus. In many of the children, the stomach was carefully examined, and it was found only in one instance to be distinctly dilated, in one of the above cases in which there was a pot-belly and a history of diarrhea. In only one child was there any area of the abdomen in which there was marked tenderness on pressure. It occurred, in this case, in the right hypochondrium, and there was no apparent cause for the symptom (the child recovered without any special treatment for this symptom). Scybalous masses in the descending colon were searched for in a few of the cases in which the bowels were said to be regular, but were never definitely palpated. Comby[21] describes symptoms resembling those of chronic intestinal dyspepsia in children in whom he has discovered floating kidney. About a dozen of my cases were accordingly examined for this condition, but in none was it found to be present.

Urine.—The urine was examined for albumin in thirty-five of the cases, and in five of these the result was positive. In all these five cases in which albumin was present, the mothers were asked to bring a specimen of the water passed immediately on getting up in the morning. This was examined, and was found to show, in every case, not the slightest trace of albumin. In none of the five children was there a history of scarlet fever. All five cases, then, were examples of cyclic albuminuria.

One of the children in whose urine albumin was present was a girl of 6 years. This age is a year younger than the age mentioned by Sutherland[22] in his table of collected cases. The remaining four children were all 10 years or older. In my series of fifty cases of chronic intestinal dyspepsia, thirteen children were 9 years old or more. The urine was examined in eight of these thirteen cases, and albumin was present, as we have seen, in four of the eight cases. As far as one could see, beyond the occurrence of albumin in the water, there was no feature in the history or clinical examination of those children with cyclic albuminuria by which one could distinguish them from the other cases, and it seems a mistake, therefore, to class as a separate disease cases identically similar to those of chronic intestinal dyspepsia, possessing only the additional symptom of cyclic albuminuria.

It may be objected that cyclic albuminuria occurs at a later age than does the disease under consideration, but we have already seen that many of the other symptoms are more prominent at special ages—thus headache is not so frequent in children under 5 years of age, and headache occurring in the afternoon occurs generally between the ages of 6 and 8. Though we cannot yet explain why cyclic albuminuria should be seen only in the older children, it would be absurd, on that ground, to set it apart as a separate disease. An excess of nucleo-albumin was frequently present, but, unfortunately, it was not always tested for, and the fact of its presence was not always noted. Its presence in excess is mentioned in six cases, and in three the reaction for its detection was negative. In all cases in which the urine was examined, the specimen was obtained in hospital, except in those with cyclic albuminuria, when the morning urine was also tested. Uric acid was not observed with the naked eye in any specimen. Frequently on standing the urine deposited a dense cloud of urates. A certain number of cases were examined for glycosuria, but in every instance the result was negative.

Spine.—In two cases there was an appreciable degree of lateral curvature, but in both it was slight in amount.

Temperature.—Except during the attacks of "gastric fever," the disease probably always runs an afebrile course. There was nothing to suggest the presence of pyrexia in any of the cases in my series at the time of examination, and, in the few instances in which the temperature was taken, it was found to be normal.*

PATHOLOGY.—The opportunity of examining the internal organs of a patient suffering from this disease is rarely obtained, and, as far as I am aware, no case has been described.

Eustace Smith[2] considers that the condition is due to an increased secretion of mucus from the whole internal surface of the alimentary canal, "a mucous flux which interferes mechanically with digestion and absorption of the food." It is true that in a considerable number of cases one can get a history from the mother of "slime" having been frequently noticed in the motions, but in the majority of instances this excess has not been observed, and in some of these cases the mothers are confident that had it been present they would have seen it; moreover, even were mucus constantly present in excess, it by no means proves that this is the cause—and not the result—of the condition. He considers that the most common cause of the excess of mucus is an antecedent attack of whooping-cough. Hutchison, on the other hand, says it is due to the excessive ingestion of carbohydrates, and especially of sugar.

It is probable that some defect not only of absorption but also of metabolism exists; in some cases the appetite is voracious, and in many of these the bowels are constipated. It seems incredible that sufficient nourishment is not absorbed, but notwithstanding this, the child continued to waste. In this relation the dense precipitate of urates so often observed is suggestive. It would be of great interest accurately to measure the nourishment taken, the amount and nature of the excreta, and the daily weight. Such an investigation, however, would be difficult and very open to fallacies, for when taken into hospital, these children at once improve and their symptoms diminish or disappear.

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* The children were always seen in the morning.

It may be well to consider shortly the theories of those who recognize the symptom-complex of the disease, but ascribe it to causes other than intestinal dyspepsia.

Twelve years ago, Sutherland[23] described a series of symptoms closely resembling those we now discuss. He attributed them to the uric acid diathesis, and, since his paper, several observers, especially in America and France, have taken a similar view. Thus Rachford[24] cites many cases, some of them showing symptoms due, obviously, to the passage of uric acid, others again having a clinical picture closely resembling that of intestinal dyspepsia.

Comby,[25] in an address delivered before the Section for Diseases of Infancy of the International Medical Congress of 1900, also described several conditions, which he said were due to the lithemic diathesis. The symptoms he describes do not, however, so closely resemble those of intestinal dyspepsia as do those described by Sutherland. Following symptoms of a nature similar to those described by Sutherland,[23] there may actually be the passage of gravel, as is described by Levison.[26] There is no doubt, however, that many of the symptoms of a great number of these lithemic children are due to intestinal dyspepsia, and that the conditions overlap. Curiously enough, one of the very best descriptions of intestinal dyspepsia is given by Sutherland when describing the symptomatology of cyclic albuminuria.[22]

Dr. Sutherland considers that, in cases of cyclic albuminuria, "there is a general pathological condition present, to which the various symptoms may be ascribed," and that this is "a condition of toxemia similar to, or identical with, that of the uric acid diathesis." As we have seen, cyclic albuminuria occurred in several of the children in my series of cases.

According to M. Rousseau-Saint-Philippe,[27] the entire pathology of childhood is dominated by "the infection of the intestinal tract, and the auto-intoxication which proceeds from it." In infancy it is the stomach and small intestine which fail; in later childhood it is, above all, the large intestine. He considers that improper food, hurried meals, bad teeth, and neglect of the bowels, are largely to blame for causing the condition. The accumulated feces, in very constipated cases, consists, he says, partly of imperfectly digested material, but also, very frequently, of intestinal sand.

Diagnosis.—Little need be said under this heading, as most of the questions of differential diagnosis have already been considered when dealing with the symptomatology of the disease. As we have seen, the malady is frequently mistaken for tuberculosis. It seems a prevalent belief that pulmonary tuberculosis is quite common in children of this age, and one cannot help thinking that the origin of this idea is to be found in the diagnosis of consumption when the disease is really chronic intestinal dyspepsia. Though it did not occur in any of my fifty cases, it not infrequently happens, especially when there are adenoids or large tonsils, that one gets on auscultation a number of moist crepitations limited to one base. Removal of the enlarged glands and general treatment soon cause these pulmonary signs to disappear. It is well to remember, as Hutchison[3] says, "that pulmonary tuberculosis is a disease almost unknown in children of this period of life." Before one knows the disease as a definite entity, one is frequently at a loss how to diagnose, and in what way to treat the numerous cases that appear, and one is haunted by a suspicion that there is "something behind" the symptoms; one's mind dwells darkly on general tuberculosis, tabes mesenterica, appendicitis, or Bright's disease, and one leaves the case with the feeling that one has failed to discover the root of the trouble. Once the existence of chronic intestinal dyspepsia of children is realized, however, the horizon clears, and, to one's own comfort, one quickly places the symptoms in their proper position, and is enabled at once to give the treatment which is found to cure or relieve the condition. A word of warning must be given, however, not to neglect to examine every case fully, for the malady frequently accompanies, and may considerably mask, concomitant disease, and though, as we have already stated, phthisis is rare at this age, still, of course, it does occur. One point of difference is the irregular progress of chronic intestinal dyspepsia—exacerbations followed by remissions. In doubtful cases the evening temperature taken for some consecutive days ought to clear up the diagnosis, and, except in the earlier stages, the child suffering from tuberculous disease is more emaciated and the skin is drier than in the milder malady. Bacteriological examination of the sputum, and the result of treatment, ought to clear up any doubt which may still remain as to the nature of the disease. If one recognizes, in milder cases, the presence of the disorder, one will be able to treat the case much more effectively, just as, in a case of head sweating in an infant, one must remember the possibility of rickets, even although, at first sight, there are no other obvious signs of it.

PROGNOSIS.—The disease is, of itself, probably never fatal. On the other hand, it lessens the strength and diminishes the resistance against other maladies, and thus frequently produces a fatal issue where otherwise recovery would have resulted. As to the prognosis of the continuance of the malady itself, very much depends on a proper carrying out of the treatment. The fifty cases whose symptoms we have studied were all treated as out-patients, and accordingly one could not be certain that, even whilst under treatment, they carried out the instructions as to diet; most of them, when sufficiently recovered, returned to exactly the same food they had had prior to being brought to hospital. At the same time, the results of treatment were very satisfactory. Every one of the children in my series of cases after a certain time ceased to attend hospital, either because they were perfectly well, or because their symptoms had become so slight that further medical supervision was no longer considered to be necessary. During the last few months I have asked the parents again to bring their children to hospital, in order that I might see how their health had been since they had been discharged. The average duration from the first visit to the last was 1 year and 8 months.

The results of my inquiry was as follows:—Seven children were said to be quite well. In twenty-four cases it was said that the health was "much improved" or "very much improved." Amongst these twenty-four cases are included some in which the only remaining symptom was an occasional attack of headache, epigastric pain, or nocturnal restlessness. In ten instances the health was "improved," but several of the former symptoms still continued, though with lessened severity. One child had died from an attack of diphtheria; he was much better prior to his fatal illness. The remaining eight cases had all improved, but had had relapses; in only two cases were they as ill as they were when first they were brought to hospital.

The prognosis in those cases in which the bowels were from the beginning regular, would appear to be better than in those in which there has been much constipation or diarrhea.

The midday urine was examined in three of the cases of cyclic albuminuria after periods of 1 year 3 months, 1 year 6 months, and 1 year 11 months. In each case there was still a trace—but only a trace—of albumin.

Tbeatment. — Without doubt, by far the most powerful remedy for the treatment of the immediate condition is change of air. That it is the actual change of air or of surroundings, and not change of diet, that does good when the child goes from home, can be seen from the fact that alteration of the diet will have comparatively little effect as long as the child remains at home, even when kept away from school. Curiously enough, it seems to be of comparative unimportance where the patient goes, as long as he has this change. Thus one of the cases in my series lived at Hindhead, one of the healthiest spots in the south of England. Before coming to hospital he had been staying for a week with an aunt in Whitechapel, and was, his mother informed me, markedly better. The only difference in his diet in town to what he had had in the country was that in the former he had had Quaker oats for breakfast in addition to his other food. Another of the cases in my series went to Aberdeen, and whilst there, her mother told me, lived largely on sugar and sweets. She returned, nevertheless, almost quite well. As long as the children are at home and their symptoms still active, one finds that cod-liver oil, and, to an even greater extent, syrup of the hypophosphites, are not merely useless, but actually deleterious. When away for a change on the other hand, these remedies generally seem to suit quite well.

The beneficial influence of change, as compared with treatment at home, is shown by the increase of weight in those cases sent for a change. In those who were weighed, the average gain of weight per week was half a pound; in those treated at home it was one-sixth of a pound.

A change causes not only gain in weight, but an amelioration or disappearance of all symptoms. A gain in weight does not always mean an improvement in the condition, however. By giving cod-liver oil in the early stages of treatment, one may occasionally, though not as a rule, get an increase of weight, but at the same time the digestion becomes more upset.

It is probable that the change of surroundings has as much, or more influence in causing the improvement, as has the change of air. Thus, when a child suffering from chronic intestinal dyspepsia is admitted into hospital, even when put on the same diet that he had before admission, he rapidly improves in health.

We thus see that change of air and surroundings is a powerful therapeutic agent in the immediate treatment of this disease. When the child has been two or three months in his new home, however, unless other treatment is carried out as well, the old symptoms are apt to return, and soon become almost as severe as ever. The treatment which should accompany this change of air, and which should be continued, more or less modified, for years, is regulation of the diet. We have seen that, *a priori*, it is probable that an excessive ingestion of carbohydrates is an etiological factor in the causation of the disease, and we find, practically, that it is essential in its treatment to limit their intake. Till the symptoms are greatly ameliorated, it is well to allow the child no sugar, sweets, jam, potatoes, new bread, sago, tapioca, arrowroot, Indian corn, flour, turnips, or carrots. At the same time one gives instructions to prevent the taking of obviously indigestible foods, such as pastry, and also orders the food to be taken at regular intervals, and nothing to be taken between meals. Because of the idea that one of the etiological factors in the causation of the disease might be the absence of an indigestible residue in the food; coarse brown bread and medium ground oatmeal in the form of porridge (made with salt, and not *too* long boiled) were ordered, and were found to be beneficial in most cases. The evening meal should be a very light one, and the child should go early to bed. The diet should thus consist of milk, rusk, thin toast or stale brown bread, eggs, lightly cooked fish, white meat or butcher meat; he may also have a little bacon, butter, or dripping, and green vegetables, or ripe fruit in small amount. Besides, if possible, a change and the regulation of the diet, other hygienic measures must be attended to. One of the most important of these is to ensure a sufficiency of fresh air. It is well for this reason, as well as to save him from mental worry, to keep the child away from school till he is considerably better. In a few cases, however, especially in winter, and where there are no parks in the neighborhood in which the child can play, he may be better at school than hanging about the streets, or cooped up in a small room at home. To sleep with the window open, and to have a cold bath— with just the chill taken off it—in the morning, followed by a rub down with a rough towel, are useful. To avoid congestion of the internal organs, it is very important to keep the abdomen and the extremities warm and dry. A flannel binder and water-tight boots and thick woolen stockings are of the greatest importance in treating the disease.

The patients should be kept free from undue excitement, whether pleasurable or the reverse, and evening parties, theaters, and excessive punishment are all equally deleterious.

Amongst drugs, the most beneficial are the alkalies, oleoresins, and bitter tonics. Bicarbonate of potash or soda and citrate of potash have a markedly beneficial effect, especially when combined with nux vomica and myrrh or coto. Thus a very useful preparation is—℞ Potas. bicarb. potas. citrat. aa 10 grs., tinct. nucis vom. 4 minims, tinct. myrrh. 30 minims, infus. gent. co. ad 2 drms. t. d. a. c.

Combined with this treatment one finds that a powder containing rhubarb and soda, with a little grey powder, given over night, is of great benefit. If there is constipation, one gives sufficient rhubarb to ensure a good motion in the morning, but when the bowels are quite regular, it is still of great use in a diminished dose, and even when there is a tendency to diarrhea, by giving a small dose one gets the astringent action of the rhubarb; thus a relaxed condition of the bowels is no contraindication to its use. Another drug of the greatest use is aloes. It is best given in the form of decoctum aloes co. When the appetite is poor, it can be given in drachm doses before meals. With this dose there is no cathartic action. When given between meals, one can give 2 drachms thrice daily, as Eustace Smith suggests, without undue laxity of the bowels; this form of administration is especially useful when the appetite is voracious. No doubt some of the beneficial action of this preparation of aloes is due to the myrrh which it contains, but one can give much larger doses of myrrh with good results. Forty minims of the tincture to a child eight years old can be easily borne. Coto is very useful as a substitute for myrrh, but probably is not superior to it. I have used tabloids of 1 gr. of cotoin (kindly prepared for me by Messrs. Burroughs & Wellcome) with excellent results. Its beneficial action seems to be due to the increased power of absorption which it causes.[28]

Carbonate of magnesia, and, when there is diarrhea and much epigastric pain, bismuth, are often of service. Quinine and the vegetable bitters, such as gentian, quassia, or calumba, are also found to be of use. Soltau Fenwick[29] has stated that in "the gastric dyspepsia of children" there is a diminished production of hydrochloric acid, and (especially as we now know that hydrochloric acid is one of the most powerful of pancreatic stimulants), it therefore seemed of use to give a dilute solution of hydrochloric acid in this malady, which was accordingly done 3½ hours after meals, without, however, any satisfactory result.

Dilute mineral acids are, however, ocasionally useful where improvement has commenced; under their exhibition, when not given too early, the child usually improves in general health; he rarely, however, puts on flesh, and his weight remains stationary, or he may actually grow lighter.

Pepsin was also given in a few cases. and seemed to have a beneficial influence; it was not given in a sufficient number of instances, however, to draw any definite conclusions as to its value. Charcoal was given as a mechanical means of removing the mucus and as a stimulant to the bowel wall, and its administration was found to be of distinct service. Small doses of alcohol given before or during meals are often useful. It is best given as sherry, slightly diluted with water, or claret. Probably the beneficial effect of some of the tinctures used in the treatment of the disease may be in part due to the alcohol which they contain. Iron is not well borne while the disease is still at its height, but during convalescence it is extremely useful; it can be given in drachm doses of vinum ferri, combined with a similar dose of decoct. aloes co. When most of the symptoms have disappeared, one may very cautiously begin to give cod-liver oil or syrup of the hypophosphites, but they must be given in small doses, and their effect strictly watched.

TREATMENT OF SPECIAL SYMPTOMS.—Little need be said under this heading, for full directions for symptomatic treatment are given in every text-book on children's diseases. One or two points are, however, worthy of mention.

Night-terrors.—It is rare that special treatment is required for this symptom, but occasionally for a few nights it may be necessary to give some sedative. Antipyrin or phenacetin have markedly calmative action.

Nervousness.—If the child is excessively nervous, bromides are frequently of great use, and can be given without hesitation until the general treatment renders their further use unnecessary.

Lienteric diarrhea.—Arsenic, in the form of minim doses of liquor arsenicalis, is generally able to control the excessive action of the bowels, and at the same time it exercises a beneficial effect on the general course of the disease. If this fail, it may be necessary to give doses of two or three minims of laudanum.

Enuresis.—Removal of tonsils and adenoids often is all that is necessary to cure the condition. Belladonna, however, even without this operation, is generally successful in stopping the the habit. It must be given in ascending doses, and it may be necessary to give it till it begins to exhibit its physiological effects. To a child of eight, one can generally give—when the drug is gradually increased—up to at least forty-five minims of the tincture, thrice daily, without undue discomfort; it seems to do good also to the general condition. It is practically always successful in checking sweating at night in these cases.

Enlarged tonsils and adenoids.—In twenty of my fifty cases, either enlarged tonsils, adenoids, or both were removed. In four of these cases no medicine or instructions as to diet were given till at least ten days after the operation. After that time two of the cases had had no more night-terrors, and no longer snored, one was less languid, and one had ceased to cough. There was no improvement in the other symptoms. Ten days is, of course, too short a period in which to see the full benefit of the operation, and when the growths are large there is no doubt that their removal is strongly indicated. When their enlargement is slight, painting the throat with some astringent, or, in the case of adenoids, a nasal douche containing such remedies as bicarbonate, chloride, and biborate of soda, and, if necessary a little chlorate of potash, will be found of great service. Removal of tonsils or adenoids will not be followed by great success, unless after the operation the child is taught to breathe properly.

By means of diet and medicines, one can probably always remove the symptoms of the disease, but it is quite the exception to get, by these means alone, a marked and rapid gain in weight, and in order to get a rapid convalescence, change of air, as already stated, is essential.

Such is a brief summary of the facts elicited from the study of a malady of profound interest, alike because of its extreme frequency and its amenability to treatment. Of necessity, my contribution to the knowledge of the subject cannot be as complete as I should desire. If others will work with me in making investigation on the lines laid down in this thesis, in time we shall arrive at a more definite knowledge of the relative importance of the factors which produce the condition. Thus we may hope to be in a position to cure, and probably to a great extent to prevent, a disease which is the cause of much needless suffering in childhood, and by the successful combating of which we will raise the physical standard of coming generations.

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SOCIETY PROCEEDINGS

NEW YORK ACADEMY OF MEDICINE

SECTION ON PEDIATRICS.

November 10, 1904.

The President, DR. DAVID BOVAIRD, JR., in the Chair.

ABDOMINAL TUBERCULOSIS.—This patient was presented by Dr. J. F. Bell. He first saw the patient, a girl twenty-two months old, in January, 1904. Her symptoms at that time were peevishness, a cough of dry and persistent character, and intermittent febrile attacks. Later these attacks increased in frequency and became remittent. The child's abdomen became swollen. In the latter part of February she had bronchopneumonia, during which the swelling of the abdomen continued. The following month she was taken to the hospital at Englewood, N. J., and remained there for some time. Dr. Koplik diagnosed the case as bronchopneumonia with malignant growth of some organ of the abdomen. About three weeks after admission to the hospital, upon the subsidence of noticeable tympanites, a tumor, extending from the umbilicus to the left flank, became evident. Purdy's test applied to clear serum which was withdrawn showed 2 per cent. albumin and small mononuclear leukocytes. No tubercle bacilli were discovered by staining the smear of precipitated serum, but a guinea pig injected with 10 c.c. of the serum developed a general tuberculosis. At the present time the mass in the abdomen was growing smaller under treatment by good feeding, fresh air and guaiacol.

Dr. La. Fetra said that recent experience tended to show that tuberculous peritonitis should be treated without an operation, unless the patient showed no improvement under prolonged medical treatment.

CLINICAL EXPERIENCE WITH ANTITOXIN.—This subject was discussed in a paper by Dr. L. Fisher, who presented some facts from his own hospital experience in regard to the dose required, a matter which he considers still empirical. A resumé of cases at the Willard Parker Hospital for two years, during which the average dose used varied from 1,500 to nearly 10,000 units, showed about 14 per cent. mortality with the larger doses, as against 21 per cent. with the smaller ones.

He also referred to Dr. McCollom's work at the Boston City Hospital. There should be no tendency to place exclusive reliance upon the antitoxin, but other established means should be employed as well, the emunctories stimulated, etc. Rash generally was evident on the fifth or seventh day, and lasted some three days. The dose should be one capable of stopping the growth of the pseudomembrane and reducing the fever. In mild cases this could be accomplished by from 2,500 to 5,000 units. But he had never seen bad results of any kind from the larger doses, and a large exudate on the pharynx and tonsils demanded from 5,000 to 10,000 units on the first day, to be repeated within twelve hours if no improvement was evident.

Laryngeal diphtheria with stenosis also required an initial dose of 10,000 units. After these doses the temperature occasionally rose slightly, but the pulse was affected very little, if at all. Feeding was very important. He did not use forced feeding in private practice.

Dr. H. W. Berg agreed that little was definitely known concerning the necessary dose, because the relation between the toxin of the disease and the antitoxin was involved in obscurity. He believed, however, that it was a quantitative relation. The severity and location of the lesions determined the dosage, a large initial dose being demanded by any severe lesion of the nose or pharynx. He thought 3,000 as good as 5,000, repeated, or even doubled, in three hours if the previous dose produced no effect. Rapidity of pulse was also an imperative symptom, 140 beats to the minute, with a temperature of only 100° F., being regarded as due to a toxic myocarditis, and demanding a large dose, repeated or doubled within twelve or twenty-four hours if necessary. The usual temperature in diphtheria usually did not run very high, and the typical effect of the antitoxin was to bring it down in from twelve to twenty-four hours. Enlargement of the lymph nodes resulted from their attempt to prevent the spread of the disease through the system, and the farther they were from the seat of the lesion the larger the required dose. In very large doses, however, such as 60,000 units, the emunctories were overtaxed. He thought the rashes due not so much to the antitoxin as to the efforts of the skin to get rid of foreign material in the blood.

Dr. W. H. Park brought up some laboratory points in reference to the statement that the relation between the toxin and antitoxin was quantitative. He said that if the two were mixed before being introduced into the system the quantitative relation held good. If a fatal amount of toxin were given and immediately followed by a certain amount of antitoxin the life of the animal would be saved, whereas, if six or eight hours elapsed before the antitoxin was given, one hundred times as much would be required, because the toxin in the meantime was combining or entering into definite relation with the cells.

Experiments in Vienna had proved that in scarlet fever large doses made no more trouble than medium ones. He had himself witnessed the splendid results in the Boston City Hospital from the use of large doses by Dr. McCollom. But it was very difficult to determine the dosage producing the best results. In mild cases involving tonsils and larynx he used 2,000 units; in severe early cases, 4,000 units; in ordinary laryngeal cases, 5,000; in malignant severe cases, 10,000, repeated at the end of twelve hours if no distinct improvement was shown. He insisted upon the fact that antitoxin should be given for diphtheria and not for accompanying conditions, such as pneumonia.

Dr. H. F. Koester did not think the rashes were due to large doses of antitoxin. The first serum in 1894 produced no rash. In cases of diphtheria with foul odor and temperature below normal he advised an initial dose of 10,000, repeated in twelve hours, as with smaller doses the membrane would still persist on the following day. Even with the larger doses the membrane might be seen, but in that case it merely lay there detached, and could be wound off on a swab.

Dr. J. Howland thought the statistics given by Dr. Fischer not convincing in the matter of the effect of larger doses. It did not seem to him that any decided reduction in the mortality could result solely from the increased dosage. He thought a large initial dose preferable to smaller repeated doses, as in the intervals of the latter the toxins were becoming fixed in the cells. As for pneumonia, in this connection, although streptococcic, pneumococcic and staphylococcic infection was present, so was Klebs-Löffler infection, and the dose of antitoxin should be larger than in ordinary cases.

Dr. M. Nicoll, Jr., also did not believe that increased dosage reduced the death rate.

Dr. Sara Welt-Kakels preferred the use of smaller doses. In a hospital in Berlin which she had recently visited the results from smaller doses were equal to those from larger. Some years ago the *Lancet* reported even larger doses than those used by Dr. McCollum, the largest single dose being 30,000 and the largest total dosage 82,000.

Dr. Scott said that the dose should be determined by the lesion, the patient's condition and the environment. In a purely diphtheretic infection small doses should be given repeatedly; in more severe infection of the tonsils and pharynx larger doses were required, also repeatedly. As high as 90,000 had been used in the Boston City Hospital.

Dr. J. F. Bell thought that serious modification of the progress of the diphtheria might result from administering antitoxin enough to produce evidences of systemic infection, such as rashes, etc.

Dr. Fischer repeated his opinion as to the dosage advisable, and said that he wished the Health Department would make a stronger antitoxin. He thought less rashes would occur with larger doses. It might be wise to drop the word "thousands" in referring to the doses, as it frightened some by its formidable sound. Large doses enabled a much earlier extubation. He closed by again insisting that hygienic measures should not be neglected.

PHILADELPHIA PEDIATRIC SOCIETY.

November 8, 1904.

The President, Dr. John H. Jopson, in the Chair.

Congenital Heart Disease.—A case diagnosed as above was peesented by Dr. G. W. Norris. The patient was a boy of five years, both of whose patients had pulmonary tuberculosis. At birth and for some time thereafter he was a blue baby. At two years of age he had spasmodic croup, accompanied by pronounced cyanosis. At three years he had whooping -cough and chicken-pox. For several years he has coughed, especially in the morning after exercise, but without expectoration. His mother says he is "always cold." He is somewhat troubled with dyspnea, and exercise occasions slight cyanosis. He is rather slender, but seems normally developed, physically and mentally.

Examination of the heart resulted as follows: Apex beat rather to the left of normal in the fifth interspace; fine systolic thrill over the whole pericardium; heart dulness on right, extending an inch and a half or more beyond edge of sternum; on left nearly normal; first sound of heart entirely replaced by a loud, long, rasping, high-pitched murmur heard between the third and fourth costal cartilages. This murmur could be heard at any part of the chest, before or behind, but was transmitted with greatest intensity toward the epigastrium.

The lungs showed a good resonance, except posteriorly, where it was impaired. Character of expiration unaltered; a few fine, moist, crackling râles heard. Pulse 120, respiration 40, temperature 97° F.

The evidence pointed to a congenital lesion, a defective ventricular septum, a patulous foramen ovale, or possibly both. A patulous ductus arteriosus may or may not be present. Tricuspid insufficiency is not probable, although so good an authority as Gibson thinks this condition much more common than generally supposed, and that it is often overlooked because it is unproductive of symptoms.

Dr. Hamill said that the situation of this murmur, with such marked transmission to the right, was unique in his experience. He thought the possibility of tricuspid insufficiency should be considered, although Dr. Norris' explanation was the more probable one.

Dr. Norris said that he had considered the possibility of a tricuspid lesion, especially as in the beginning the murmur was best heard in the tricuspid area. Later, however, he was certain the greatest intensity was on the sternum at the junction of the third or fourth rib, and there had been no signs of tricuspid regurgitation. He consequently dismissed the idea of a tricuspid lesion.

HYPERNEPHROMA OF THE RIGHT SUPRARENAL GLAND AND HYPERTROPHY OF EXTERNAL GENITALS IN A TWO-YEAR-OLD GIRL.—Dr. V. Nesbit and Dr. C. Y. White presented specimens taken from a patient who had been exhibited at a previous meeting of the Society (October 13, 1903). At that time the case was diagnosed as sarcoma of the kidney with secondary deposits in the liver. It was not possible to diagnose correctly during life, but the autopsy revealed a large tumor of the right suprarenal gland, with metastasis to the liver, mesenteric lymph nodes and right lung. The character of the tumor was determined only by the microscope, which proved it to be a hypernephroma.

There was hypertrophy of the external genitals, and a growth of coarse hair on the pubic region, the prepuce retractile, and the clitoris was 4 cm. long. The internal genitals, except for enlargement of the ovaries, were normal.

Since being seen by the Society the child had undergone an exploratory laparotomy (October 23, 1903), but so many adhesions were found that removal of the tumor was abandoned. She also recovered from measles and broncho-pneumonia within the past year, but died from exhaustion in the latter part of September. The symptoms had continually increased in severity, including congestion of the face, dyspnea and abdominal enlargement. The skin was dark, but never bronzed.

Dr. Jopson said that the case was interesting because of the relatively good health maintained during the presence of so large a mass, and also in relation to precocious puberty, a condition seen in pelvic tumors and attributed to an increased blood supply.

TYPHOIDAL INSANITY IN CHILDREN.—This subject was discussed in a paper by Dr. D. L. Edsall, who thinks such cases of more frequent occurrence, and often with graver prognosis, than is generally supposed.

The various forms of insanity occurred in the following order of frequency: 1, mania; 2, dementia; 3, simple delusions, hallucinations and the like; 4, simple melancholia without maniacal tendencies. Very many of the dementias persist and a certain proportion of the manias and melancholias do not recover. The nutritional element is of the greatest importance.

Dr. J. P. C. Griffith thought that typhoidal insanity in children, especially in the milder forms, was more common than the literature would indicate. Typhoid fever itself was more frequent than statistics would indicate, for the milder forms were often overlooked. Consequently a misleading mortality was quoted, owing to the fact that a larger percentage of the cases reported resulted fatally than of the total number actually occurring. Similarly the prognosis in the total number of cases of typhoidal insanity would give a more favorable showing than in the more serious cases found in statistics.

Dr. Griffith had observed several cases of such insanity, one of which was characterized by a varying condition of profound depression and excitement with curious delusions, mostly associated with fear. Another of Dr. Griffith's cases enforced Dr. Edsall's insistence upon the point of nutrition, since the patient had been extremely delirious and had eaten almost nothing Nothing was done to combat this condition and the delirium increased, becoming wilder as the fever abated. He finally recovered, but for days at a time screamed almost without pause until he had to stop from exhaustion.

In many cases of typhoid fever mental confusion was more conspicuous than a normal course of the disease would account for, and when, as often happens, distinct delusions appeared, the patient should be most carefully nourished, with a view to prevent the development of insanity.

Dr. Griffith thought that the period at which insanity developed would throw light on the question as to whether it was toxic or nutritional, the former being likely if it developed during the course of the disease, the latter if during convalescence.

Dr. Hamill spoke of a patient whom he had seen in the Philadelphia Hospital who was kept on a liquid diet because of the persistence of a temperature slightly above normal. He kept asking for food, even after becoming maniacal, and when food was given the mania disappeared. Dr. Hamill had never seen insanity following the fever in children, but had frequently noted hallucinations and delusions during the progress of the disease, especially last winter at the Polyclinic Hospital. One patient also screamed at the top of its voice whenever it spoke. After this had continued for some time, with hallucinations and delusions, the child suddenly became entirely rational in a moment. Dr. Hamill thought that some typhoid epidemics exhibited the accompanying mental disturbances more than others.

Dr. Eleanor Jones mentioned a case that was also evidently nutritional.

Dr. Edsall explained that he did not mean to assert that the insanity was always nutritional. It was certainly often toxic in origin, but even in such cases persisted because of poor nutrition. He mentioned the case of an adult patient whose food was considerably reduced on account of repeated and severe hemorrhages. At first begging for food, the man afterwards fell into a state of inanition, would take little food, became emaciated, and then insane. Forced feeding was resorted to and an improvement noted, but the man died, probably, from a heart lesion of some standing. Alienists in general recognize the importance of the nutritional element, all the more so because it is generally easily controlled.

Dr. Griffith wished to know if Dr. Edsall had discovered any relation between the insanity and aphasia. Henoch and other authors assert that aphasia is a common sequel of typhoid fever, and he asked whether the literature showed many instances of true aphasia under such circumstances.

Dr. Edsall was inclined to think that whereas true aphasia did sometimes occur, many of the cases so called were merely part of the stupidity or depression of the general mental disturbance.

EDITORIAL

THE SURGICAL REPAIR OF BRACHIAL BIRTH PALSIES.

The considerable number of children seen every year at the neurological and orthopedic clinics, suffering from the persistent lesions of brachial birth palsy, leads one to think that the optimistic prognosis as to spontaneous cure so commonly given during infancy is either erroneous or the whole number of cases produced must be very large.

Certain it is that many individuals are going through life handicapped by the partial or total disability of one upper extremity as a result of this lesion.

The favorable prognosis usually given has probably done more than anything else to restrict treatment to the purely expectant type.

Only within the last half decade has the lesion been considered with reference to surgical treatment.

A knowledge of the pathological conditions present in the nerve trunks of these chronic cases must be the foundation for rational surgical treatment.

A study of a series of specimens from five cases, the results of which were presented before the Neurological Society recently, shows that the prime factor is a cicatricial blocking of nerve. The cictarices result from tearing (due to overstretching) of the neurilemma, which, in healing, shrinks and strangulates the nerve fibres; and from organization and contraction of the blood effusion which accompanies the damage to the neurilemma.

The nerves most often involved are the 5th and 6th cervical roots. In the more severe cases the remaining roots of the brachial plexus are also involved.

There may be a single cicatrix or several cicatrices present.

With this kind of lesion there can be no hope of spontaneous nerve regeneration, and therefore impaired growth and deformity of the extremity become more marked by contrast as the development of other portions of the body occurs. Naturally, only one kind of treatment can promise anything in the way of results, and this consists in the excision of the damaged nerve tissue followed by end to end suture.

Cases were first treated in this way by Robert Kennedy of Glasgow, and a short time later a series of cases was operated upon in this city, with results sufficiently good to give the operation a definite place in the realm of surgery. The age at which operation is best undertaken is still a matter for discussion, but all things considered, about twelve months is the time of election. If by that time recovery has not occurred it will never be complete without surgical interference. Meanwhile, contractures should be prevented, and the general nutrition of the extremity maintained by massage, electricity and suitable passive motion.

Alfred S. Taylor.

ABSTRACTS

Gastric Ulcer in Children.—E. G. Cutler, M.D. (Boston Med. and Surg. Jour., Oct. 6, p. 367) says gastric ulcer in children is rare. A careful search of the literature revealed only 26 cases, in 24 of which a necropsy was made. To these the writer adds 3 cases from the records of the Massachusetts General Hospital.

Case I.—A boy, aged 12, was admitted on June 25, 1889. He was ill in the previous summer with inflammation of the bowels, and since then had been rather pale and not strong as before. At times his face and pillow were stained with blood in the morning. A fortnight before admission he had a sharp attack of epigastric pain, which lasted two days. About two hours after the onset of the pain he vomited a cupful of blood. Since then he occasionally complained of pain, but not particularly after eating. Physical examination was negative. Under treatment recovery followed.

Case II.—A child, aged 8, was admitted on Aug. 12, 1901, with a history of vomiting of food and bright red blood a week before, pain after meals, constipation and headache. The face and mucous membranes were pale, and there was tenderness below the xiphoid cartilage. Under milk diet recovery took place.

Case III.—A girl, aged 6, was admitted on Feb. 7, 1904. For a week she had been restless, and three days before admission there was pain on the right side of the abdomen. On the day of admission she bled from the nose and mouth. About a quart of blood was said to have come away in clots. At the time she did not cough or appear to vomit. A loud mitral systolic murmur was heard over the precordia. There was no abdominal tenderness. The temperature was 102°, and the hemoglobin in the blood amounted to 85 per cent. On the 10th an enema was followed by a motion containing much dark blood. Under treatment recovery took place.

The following case, reported by Dr. J. F. Goodhart (Trans. Path. Soc. of London, Vol. 32), is an example of gastric ulcer in the new-born. The resident obstetric assistant at Guy's Hospital was called to a new-born infant who was vomiting blood, from which it died thirty hours after birth. It was apparently well-formed and healthy, though congenital syphilis was possible. The stomach was found distended with clot, and a small ulcer was seen at the cardiac end near the greater curvature. The edge of the ulcer was sharp, raised, firm, pink and vascular. In the bottom of the ulcer was a dark speck which, under a lens, proved to be an opening in an artery running along the greater curvature.

In the 29 cases there was a remarkable preponderance of the female sex: 18 of the cases occurred in females, 5 in males, and in the remaining 6 the sex was not stated. Six of the cases occurred soon after birth; the youngest patient was thirty hours old, and the others were 2, 5, 7, 11 and 15 days old, respectively. In 8 cases the age was less than 7 years, and in 9 cases it was between 8 and 13 years. In infants the first symptoms observed were restlessness and hematemesis or melena; there was evidence of pain in one case. In older children dyspepsia or abdominal pain usually preceded the more characteristic symptoms. Epigastric pain after meals was described in five cases, and in one it was severe. The pain usually was located in one spot in the epigastrium; occasionally it was in the back, sometimes it was referred to the abdomen as a whole. A tender spot was frequently found below the xiphoid cartilage. Vomiting occurred in 16 cases and hematemesis in 11. In the chronic cases the ulceration had an inhibitory effect on the growth and nutrition. Perforation occurred in several cases.

The Diagnosis of Cerebellar Abscess Secondary to Otitis Media.—H. B. Robinson, F.R.C.S. (Lancet, Dec. 3, p. 1566).—A boy, aged 13, was admitted to St. Thomas's Hospital on May 27. Since an attack of measles, eight years before, he had had a fetid discharge from the left ear. For three weeks he had had pain in the ear and head. The discharge had stopped and there had been incessant vomiting and obstinate constipation. For the last two days he had been very drowsy. He had got rapidly thinner since the onset of his illness. On admission he complained of pain in the head, which could not be specially localized. There was tenderness behind the left ear, with some edema over the mastoid but no discharge. The membrana tympani was destroyed and the tympanum was filled with granulations. The pupils were equal, reacting to light and to accommodation, the vessels of the fundi were rather full and tortuous, the edges of the discs were blurred, and the discs themselves were slightly swollen. The grip of the left hand was weaker than that of the right; the left knee jerk was increased, but the plantar reflexes were equal and normal. He tended to curl up on the right side.

A curved incision was made behind the pinna, and this was drawn well forwards with a gauze retractor passed through the meatus. The mastoid antrum was opened with a gouge and pus escaped; the posterior wall of the meatus was taken away and the antrum and tympanum were freely thrown into one. The pus appeared to come from the posterior part of the antrum and from the groove for the lateral sinus. The groove was opened up and the sinus was exposed, but this was not the source of the pus. In so doing the sinus was slightly lacerated and blood welled up freely, showing no thrombosis. The bleeding was easily controlled by gauze pressure. Further exploration showed that the pus was coming through the posterior wall of the antrum itself, just in front of the sigmoid sinus, and it ran away freely on introducing the pus seeker. The opening in the bone was further enlarged, when the underlying dura mater was seen perforated and the escaping pus pulsated a little and was very foul-smelling. A silver drainage-tube was passed into the abscess cavity and packed round with gauze.

After the operation the temperature fell from 102.4° to 99°, and the patient was drowsy. On the 29th the morning temperature was normal, and there was nystagmus from left to right in both eyes. On the 31st he was conscious, though somewhat dull; the nystagmus movements were of less frequency. On June 4 he was still somewhat apathetic and showed slight incoördination in the finer movements, such as trying to button his jacket. On the 9th his mental condition was improved; speech was indistinct; some nystagmus was still present; and the left arm was a little weaker than the right. On the 15th there was still perceptible weakness of the left arm, the nystagmus was almost gone, and both knee-jerks were rather feeble, but the left was the more forcible. Recovery followed.

The important points in the case are the evidence which enables cerebellar abscess to be diagnosed, and the drainage through the mastoid in front of the sigmoid sinus. The symptoms pointing to cerebellar abscess were weakness of the left upper extremity and increase of the left patellar tendon reflex on the same side as the lesion, and the tendency to curl himself up on the right side—on the opposite side to the lesion. These symptoms, with others, have resulted from the experimental removal of one lateral lobe of the cerebellum as demonstrated by Luciani and Risien Russell, which observations have been confirmed clinically, especially in a case reported by Dr. T. D. Acland and Mr. C. A. Ballance. The weakness of the upper extremity on the same side as the supposed brain lesion would at once arrest attention and suggest its origin. Luciani considers this the result of the abscess cutting off from the opposite cerebral hemisphere the reinforcing influence of the lateral lobe of the cerebellum. The fibers thus involved pass through the superior cerebellar peduncles, and an abscess in any part of the cerebellum which did not involve the course of these forces should not produce the symptoms. The fibers of the superior peduncles are particularly related with the dentate nucleus, some being connected with its cells while others pass through it on their way from the cerebellar cortex. Should the lesion involve this portion of the cortex or the region of the dentate nucleus, there may be weakness of the upper limb or of both limbs, on the same side as the lesion. It appears that the lesion must be deeply placed to the inner and front part of the lateral lobe, and in the present case the abscess was certainly in front, and also deeply placed from the distance the tube went in. In some cases there is weakness of the lower limb on the same side as the lesion, but less than that of the upper.

The increase of the patellar tendon reflex on the same side as the lesion is also explained by the weakening of the cerebral influence. The tendency to curl up on the opposite side was noticed by Risien Russell in monkeys after removal of one lateral lobe, and clinically in cases described by Ballance, Deanesley and Gamgee. Conjugate deviation of the eyes to the opposite side is not retarded, although it may have existed. It was obtained experimentally by Risien Russell, and noticed in Acland and Balance's case. Nystagmus was not noticed until the second day after the operation, and the movements were away from the lesion; they should be to it. Perhaps it was due to some injury of the external semicircular canal at the operation.

PEDIATRICS

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ORIGINAL ARTICLES

THE NATURAL NOURISHMENT OF INFANTS.

By Dr. Joh. Hugo Spiegelberg,
of munich.[1]

(Translated by Henry Larned Keith Shaw, M.D., Lecturer in Pediatrics, Albany Medical College.)

L. Emmett Holt in his widely known text book on "Diseases of Infancy and Childhood," says in substance that while nothing is as good as breast milk, yet improper breast milk gives most unfavorable results. He also says that among the upper classes where the milk can be properly prepared and attended to, "one should not be slow in adopting artificial feeding in cases of doubt." It would appear from this that the nursing ability of the American women has not yet reached a satisfactory state of development. Holt himself states that not more than a fourth of the mothers in his private practice who earnestly desire to nurse their infants are able to continue longer than the third month.

These words impressed me strongly because they reveal not only the confidence our American colleagues place in the artificial feeding of infants, but also the relative unimportance they place on breast milk feeding. As a natural consequence physicians remove the baby from the breast for slighter provocations than the teachings and experiences of the German pediatrists permit. The employment of wet nurses unfortunately is not so generally adopted in America as with us and the difficulties in securing a suitable wet nurse tend to restrict further the natural form of nourishment. It must be said that even in Germany the ability of the women to nurse their infants is still far from perfect but by earnest endeavor and proper instruction many women can still

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*Courtesy *Albany Medical Annals.*

be brought to fulfill this first and most important duty to their children. The conditions of life and the demands of society at the present time, however, render maternal nursing an art requiring a certain amount of what might be termed technical instruction in addition to a physiological ability to nurse.

It is my purpose in discussing breast milk feeding not to dwell upon the commonly accepted axioms or unimportant details. The vast importance of breast feeding in comparison with any substitute is too little recognized by the profession at large. Physicians should be convinced that unless well grounded contraindications exist, days, weeks or a few months of breast feeding even if it supplements artificial feeding to a small degree is an advantage of great importance not only to the immediate development of the child but also for his whole life. Nothing can take its place and it should not be withheld from the child.

The sense of duty that induces a mother to nurse her child is gradually extending more and more owing to earnest work by physicians. Where this feeling is lacking it should be aroused. The question asked by the public "Shall I nurse?" should no longer be a question for the physician. The query is merely "Can she nurse?" with the subsidiary question "May she nurse?"

To consider the last question first it must be said that there are but few circumstances that prevent a woman from nursing. No general rules can be laid down but each case must be determined on its own merits by the physician.

Syphilis.—An uninfected mother should only be advised or permitted to nurse a child infected congenitally through the father if knowing the conditions she voluntarily consents for the sake of the child which in such cases is usually debilitated and often premature. On the basis of Colles' law such mothers are relatively immune against infection through their children but exceptions have been recorded especially among primipara. A syphilitic mother may not nurse an uninfected child. If both mother and child are affected it is doubly important for the child that it should be nursed by its mother.

Tuberculosis.—Tubercular infection in the mother is an absolute contraindication for nursing. The danger lies not in the passage of toxins or bacteria through the milk but in the intimate associations between the mother and the child. Even though the mother does not nurse she must exercise the greatest care not to infect the child. The function of lactation, moreover, is a drain upon the system of tubercular women that must be strictly guarded against.

Acute Infectious Fevers.—Fevers in general form no contra-indications to nursing unless associated with marked prostration or collapse. There is no reason, for instance, why a mother suffering from diphtheria should not nurse her child if stringent precautions are observed against infection through the air, clothes, etc. The fever itself exerts no deleterious influence on the milk and immunization of the child is affected through the milk in a number of these cases.

Nervous System.—The strong influence exerted by the nervous system upon the secretion—not the formation—of the milk is well known. It is unscientific to say that mental disturbances and diseases can be transmitted through the milk from mother to child. Moreover it has not been proven that the chemical or physiological composition of the milk are directly affected by nervous disorders. The quantity and quality of the milk, however, depends much on the regularity and completeness with which it is taken from the gland. Resorption takes place if the breasts are not regularly emptied. This resorption slowly produces certain changes in the quality of the milk and a resulting diminution in the quantity. As the secretion of the mammae is influenced in a pronounced manner by the general nervous alterations it follows that nursing difficulties are more frequent in "nervous" women. It must be determined in each single case whether or not these difficulties are sufficient to forbid nursing.

The question "Can the mother nurse?" must partly be considered before the birth of the child. Mothers who have successfully nursed one or more children and whose health and breasts have suffered no change probably will have no difficulty. The widely spread inability to nurse lies chiefly in the inactivity, hereditary atrophy of the mammæ, bad customs, etc. In these cases very often can the succeeding generation be made capable of nursing by proper prophylactic care.

The presence of the glandular tissue, which must be differentiated from adipose tissue,can be detected by palpation towards the end of pregnancy. The secretion of a few watery drops shows that the function of the glands is normal. Rubbing the nipples and breasts with alcohol is a good preparation for nursing as it tends to harden the skin and renders it less liable to irritation and disease.

Mastitis and depressed nipples are the two most important external contraindications to nursing. If the infant cannot grasp the nipple the best breast is of no value. Massage of the nipple has little effect when the depression is of a severe grade but for the simpler cases the breast pump or certain mechanical nipples can be employed. The nipples and breasts are not fully developed until lactation commences. Cleanliness of the parts and regular and complete emptying of the breasts will prevent mastitis.

The most frequent excuse or reason given for not nursing is that there is "no milk" or "not enough milk." In order to discuss this point intelligently we will briefly consider the physiology of lactation. A few drops of a yellowish watery fluid appear towards the end of pregnancy. This fluid becomes more profuse a few hours after birth until the second day and can be squeezed out in a fine stream. This first milk or colostrum is rich in globulin and poor in fat. It forms a transition period in the production of milk. The colostrum bodies are leucocytes which remove the fat from the milk as long as no removal of the milk takes place. Any later damming back and resulting absorption results in the reappearance of this colostrum milk. The colostrum disappears and normal milk appears as soon as the infant is able by vigorous sucking to establish the full secretive powers of the glands. The breast milk is slower in appearing where there is any interference with a complete removal. Weak and premature infants, undeveloped nipples, breasts, etc., are among the causes producing this interference. Artificial removal should be employed in these cases or another and older infant placed on the breast. The latter means is the rule in our foundling asylums and babies' hospitals.

Whether the breast can secrete enough milk cannot be judged before the tenth to fourteenth day. A complete removal with avoidance of retention is the Golden Rule of lactation and with this precaution nearly every mother can be safely carried through the puerperal period perfectly able to nurse her baby. During the entire period of lactation the same rule should be observed.

"La quantité du lait varie avec la demande," says Budin and the experience in our Säuglingsheim confirms his view. There the wet nurses are able to nurse two or three infants and yet can withdraw milk by massage for the sick infants. Professor Schlossman in Dresden has wet nurses who can furnish as high as four and three quarter liters of milk daily and in our Munich Säuglingsheim the same amount has been obtained without difficulty. The reverse of this experience is often seen when a good wet nurse leaves the hospital to go into a private family and is soon sent back because "she has no milk." The reason for the incomplete removal lies in the small size or weakness of the baby or in bad habits of nursing such as irregular and too frequent feeding. The appetite of the child is thus destroyed and the breasts become accustomed to secrete only small quantities of milk. The remainder is reabsorbed and the total amount diminished. The following case illustrates this point. A wet nurse at our Säuglingsheim secreted two and a half to three liters of milk daily and left to take a position as private wet nurse. She was returned to the hospital in less than two weeks with the complaint that there was not enough milk. A test at that time showed the milk reduced in quantity to 100 cubic centimetres. At the end of a week under the original hospital conditions the amount of milk had risen to two and a half liters per diem. This seems to demonstrate the truth of Budin's axiom. Since these women are able to produce more milk than is required for one child it follows that every healthy woman is capable of producing a normal amount of milk provided the nursing is governed by the rules already mentioned. Nevertheless no physician would deny that some women are incapable of producing a requisite amount of milk. Such women should never omit to nurse their babies as much as they are able and the deficiency should be replaced by artificial feeding. This "allaitement mixté" to which we will refer later, enables many mothers to give their infants the benefits of partial breast milk feedings. It may lead to a more copious secretion and even to a normal nursing ability in later lactations.

The baby should not be taken away from the breast during the first few weeks of life on account of insufficiency of the milk unless it is absolutely necessary. The involution and puerperal period are benefited by regular nursing. The child should be given the breast for the first time from six to twelve hours after birth. It is often a difficult and long struggle to make the infant take hold of the nipple.

The nursing should be repeated at irregular intervals until the child begins to drink. Then the intervals should be gradually lessened to three hours. Only premature or otherwise weakly children should be nursed more frequently. In the second six months four-hour intervals will rarely be too long and these may be later increased to five hours. The stomach should be empty before it again receives food. The night feedings should not be oftener than six or eight hours. Regularity in nursing diminishes the care of the mother and interferes less with her ordinary duties and habits. The first nursings are quite painful and the uterine after-pains show the close physiological relation between lactation and involution.

The entire nipple should be taken into the child's mouth, as one of the most common causes of fissures is an incomplete grasp of the nipple. These fissures are extremely painful and present points of entry for bacteria and a resulting mastitis. They should be properly treated but they do not form a sufficient ground for interrupting the nursing. The child can swallow blood from the fissured nipple—which may cause vomiting and bloody stools and give rise to a faulty diagnosis (melæna).

I shall not enter into a consideration of the chemistry and physiology of milk nor the differences between mother's milk and cow's milk. It is well known that breast milk is subject to marked changes in different individuals and in the same individual at different times. The first milk from a normal breast is low in fat and high in proteids and at the end of nursing the fat is high and the proteids low. Pawlow has shown that fat and albumin together are very difficult of digestion. The fat retards the gastric secretions and increases the pancreatic juices so the albuminoids are not acted upon by the proper gastric ferments. Breast fed babies therefore have the decided advantage of digesting the albuminoids before the fat is received in the stomach.

The physician should always examine the milk whenever there are disturbances waranting it. The examination should include the macroscopic appearance (color, consistency, etc.), microscopic (colostrom, size of fat globules) specific gravity, sugar and fat determination. The Babcock method is much used in America for the estimation of fat. The quantitative determination of sugar can be made by Fehling's method. In place of the tedious quantitative estimation of the proteids one can determine the amount of total solids and deduct the percentages previously determined for fat, sugar, and salts (.2 of 1 %) [*Medical Record No. 14, 1903*]. The appearance of colostrum corpuscles during lactation always indicates a resorption of the retained milk and the danger of the milk's drying up can only be prevented by a thorough emptying of the breast. In such cases the amount of colostrum will have prognostic value.

When a nursing infant is taking enough proper milk there will be a uniform gain in weight. The infant should be satisfied with seven feedings at first of from ten to twelve minutes duration and later this number may be reduced to five.

As the majority of our mothers are incapable of sufficiently nursing their children it is of great practical importance to determine the average amount of milk necessary for a normal nursing child. Numerous observations of the average amount of milk taken by normal breast babies at different feedings has appeared in the German as well as foreign literature. Those who have systematically weighed a baby before and after a nursing know that the quantity taken at each nursing varies as well as that taken for the entire day—another essential difference between physiological and artificial feeding. From calculations made by different authors it can be said that a strong breast baby in the first two months consumes daily about one-fifth of his body weight of milk. In the second quarter of the year this quotient diminishes to one-sixth or one-seventh and in the later months to one-eighth or one-ninth. For example, a two months' old child weighing 4000 grammes would take one-fifth of 4000 or 800 grammes daily. A six or seven months' old child weighing 7000 grammes, would take at the utmost 1000 grammes.

From the most reliable observations I have prepared formulæ that express this relation and can recommend them as being fairly reliable for the average feeding. They can be adapted for any infant at any period of lactation.

The quantity of mother's milk is represented by x, the weight of the child by p, the age in weeks by w, and the age in months by m.

The formulæ from one to six months would read $x=\frac{p}{100} x \frac{78-w}{4}$

Example. A child of six weeks weighs 4200 grammes.

$x=\frac{4200}{100}\times\frac{78-6}{4}=x=42\times18=x=756$ grammes, the required amount of milk.

For the remainder of the time the child is fed upon milk the formulæ would read: $x=\frac{p}{100}\times(20-m)$.

Example. An eight months baby weighing 8500 grammes.

$x=\frac{8500}{100}\times(20-8)=x=85\times12=x=1020$ grammes.

The indications that a sufficient amount of proper nourishment is being given are found in the increase of weight and in the function and general appearance of the bowels. The weight curve in healthy breast babies shows greater regularity than any form of artificial feeding. There are no abrupt changes either in loss or gain. A weekly increase in weight of 150-200 grammes is sufficient for the first few months. As the child grows older the weekly increase in weight diminishes. The body of the infant should show a uniform development without any disproportionate increase in the amount of fat. The pale, waxy hue of the fat, flabby body of the overfed breast baby is an evident sign of ill health. The bowels should be evacuated spontaneously several times a day. Provided the movements are normal they may be even more frequent in a healthy breast baby. The normal breast stool has a characteristic and sour odor entirely different from the usually fetid odor of the cow milk stool. The color is golden yellow and the consistency is seldom the ideal homogeneous but is usually thinner and contains small clumps. The reaction is invariably acid. Chemically it is poorer in organic phosphorus than the cow milk stool. Bacteriologically one finds Gram-staining acidophilous bacteria in almost pure culture. A greenish, clumpy, mildly dyspeptic stool resembling the early colostrum stools may return at any time during lactation in consequence of some gastro-intestinal disturbance. Constipation easily occurs in overfed breast babies and also in underfed breast babies on account of the almost complete absorption of the mothers' milk (pseudo-constipation of Czerny.)

An infant receiving sufficient food urinates frequently because the amount of urine should equal from 60 to 70 per cent. of the milk consumed if the proper amount of nourishment is taken.

Before considering the question of weaning it might be well to discuss briefly the nourishment and hygiene of the mother. This is generally regarded by both the physician and the laity as a most important question. Formerly a great many things were forbidden and a strict diet prescribed. A nursing mother was urged to take gruels, large quantities of milk and foods rich in carbohydrates. Beer was and still is considered by many people as an indispensable factor in producing an adequate amount of milk. Fish, game, fatty goods, salad, fruit and many other things were forbidden. To-day, however, we do not conform to a narrow diet. Schlossmann has shown that a nursing woman should be allowed to eat whatever she wants provided it does not disturb her digestion. He claims that monotonous over-filling is unnecessary and results only in spoiling the mother's appetite and thereby impairing her health and efficiency. The nursing mother should observe a certain caution in taking spices, acids and other things transmittable through the milk. She should also abstain from the much vaunted beer and other alcoholic beverages. Schlossmann, who is one of our first authorities, supports this opinion. These beverages in no way tend to increase the quantity of milk secreted. Their only action is dependent upon a possible increase in blood pressure but the same goal is reached by exercise, fresh air and the ingestion of large quantities of otherwise harmless fluids. As to the question of lactagogues, many of these are on the market and the manufacturers and druggists loudly proclaim their powers. I consider them all superfluous and many have not even the advantage of being harmless. The best lactagogues are good hygiene and moderate exercise. The secretion of a liter of milk daily represents a considerable expenditure of energy on the part of the mother that must be compensated for. On this account while she need not give up her customary household duties, yet she must guard against over-exertion, exciting amusements, mental emotion, etc. Menstruation may possibly cause a slight restlessness or a light dyspepsia, but the baby should never be removed from the breast on this account. Neither menstruation nor a new conception are hindered by nursing a child although pregnancy may put an end to the nursing after a space of time.

The change to a mixed food should take place about the ninth or tenth month. The practice of nursing after the tenth month and even into the first or second year is contrary to physiology. Milk after this time does not contain all the elements demanded by the rapidly growing organism. As an illustration I need only mention the lack of iron in mother's milk as shown by the investigation of Bunge. The eruption of the first teeth between the fifth and sixth month is no indication for weaning. The mechanism of suckling prevents biting and only when the infant does not receive enough nourishment does he show his teeth. The weaning should take place gradually. Sudden weaning is associated with some danger to the infant and moreover until it is ascertained that the artificial food agrees with the infant, the breast milk should not be entirely withdrawn. This is termed "allaitement mixté." We have already spoken of the advantages of this method. Where the secretion of milk is insufficient, when it is necessary to cover a temporary deficit in the amount of milk, where the occupation of the mother prevents her nursing at certain periods of the day, where there are twins and the demand upon the breasts is excessive—in all these cases this method is indispensable. It can be carried out in two different ways. The infant can receive some artificial food at each nursing, in which case it is mixed with breast milk in the stomach. The best way, however, is where some of the feedings are entirely replaced by the artificial food. The substitution should go on slowly and the weight and stools be carefully observed. When the number of breast feedings has been reduced to two, one can proceed more quickly on account of the danger of the milk drying up and the colostrum bodies reappearing.

I prefer for the mixed feeding and later artificial feeding a mixture of cow's milk and a 10 or 15 per cent. solution of Soxhlet's Nährzucker (dextrin, malt and lactose slightly acidified). The proportion of milk is slowly and carefully increased. Broths and cereals can be added to the diet when the child reaches the age of physiological weaning.

I will not dwell upon the question of wet nurses as I know that they are not so favorably received in America as with us. It seems to me better that an unmarried woman should use her nursing capability for the benefit of others than to allow it to dry up unused under the pressure of her social condition. It would be better for her and for her child. The same general rules apply to wet nurses as to mothers.

I have outlined a few of the more important features of breast feeding as regards a normal healthy baby. There is little further to be said about the nourishment of sick infants than that demanded by the pathology and therapy of the disease. It is important to bear in mind two things: first, that the lives of many weak, atrophic, premature, syphilitic, etc., infants can be saved by breast milk; second, that in severe gastro-intestinal disturbances of breast babies it is seldom necessary to stop nursing or to change the diet except to reduce the quantity. In many cases of gastro-intestinal disease in artificially fed infants the best medicine is breast milk.

In conclusion I would again state that there is no satisfactory substitute for breast milk. Perseverance, intelligence and patience, however, will enable many more women to give their children, at least partially, the benefits of mother's milk. Every woman, where no contraindications exist should attempt to fulfil this great duty.

The exercise of this function will tend to improve the nursing ability of generations to follow. By its more general use one of the chief causes of the high infant mortality will be removed and the health and strength of the oncoming babies will be improved, and we will fulfil the demand of Rosseau "retourner à la nature."

WHEN AND HOW TO WEAN THE BABY.*

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The object of this paper is to consider the necessity for a more careful study of that change in the dietary of an infant which so often, when made at the wrong time and in an injudicious manner, leads to sickness then or lays the foundation for more sickness at some future date. A glance at the vital statistics of any city or county shows such an enormously large proportion of deaths during the first year, the time when nearly all infants are weaned, that we are compelled to ask the question, "Is this high rate of mortality in any way due to weaning, is it avoidable, and if so, how can we avoid it?" Vital statistics show us that one infant out of every five dies during the first year and that one out of every three dies during the first five years.

As the great majority of deaths are preceded by sickness, it is reasonable to suppose that the nature of the sickness incident to children during the first year might form some clue to this great mortality. When we consider the causes of death among infants at this age, we find that two-thirds of the deaths are traceable to acute or long-continued disturbances of the digestive organs.

If we remember that the weaning period is the one most likely to test a mother's knowledge of human milk and infantile foods and ability to apply this knowledge, and also that period which shows clearly the infant's power to digest foods other than human milk, we realize that a great portion of this two-thirds mortality rate during the first year must be due to the necessity of early weaning or owe its beginning to errors committed then. The experience of physicians corroborates this view. Mothers who thoroughly understand how to wean a baby safely very seldom commit serious errors in feeding their infants afterwards, and consequently, contribute very little to the high two-thirds proportion of infants' first year mortality.

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* Read before the Wayne County Medical Society, Detroit, Mich., Dec. 5, 1904.

That we may understand the importance of this subject, let us look at the number of deaths tabulated by the Health Board of the State of Michigan. Excluding all still-born infants, in the year 1890, there were 6542 deaths recorded of children under one year old. Two-thirds of this number shows 4361 deaths in Michigan in 1890 due to digestive disturbances and their results, the great majority of which could be avoided if the mothers of these infants weaned them at the proper time, used the correct foods and gave only the proper quantities of them. In other words, if the mothers knew the correct time and way to feed their infants when weaning them, over four thousand lives would be saved yearly in this State and all this saving of lives would occur among infants less than one year old. How many more could be saved during the second and later years by using a correct dietary, it is impossible to state.

If we look a little closer home and examine the mortality statistics of our own city, Detroit, we see a correspondingly striking result. In the fiscal year ending June 30, 1903, there were 1187 deaths of infants under one year old, and 1167 deaths in the same year from all causes among all our citizens between one and thirty years of age. This shows that if we separate those of the first year and then average these 1167 deaths over the different ages from one to thirty years, we have in that year more than twenty-nine deaths of infants under one year old for each death at 2, 3, 4, 5, or any age between one and thirty.

Nearly all our epidemic diseases occur in individuals over one and under thirty years old, and our health officers are mostly occupied in caring for the families of those suffering from these diseases and preventing all others from contracting them. Is it not a striking commentary on our christianity and civilization that we establish health offices, employ special sanitary officers and equip them with all the needed trained assistants and appliances at heavy cost to the public in order to avoid half a dozen funerals from small-pox and perhaps fifty from scarlet fever or diphtheria while we look complacently and indifferently at our hearses while they carry each year nearly twelve hundred of our little babies to their early graves? For these hundreds that die from the results of an unsuitable dietary, we instruct our health officers to give death certificates as rapidly as they are demanded but do not empower them in any way to lessen this number.

For the very limited number who die of epidemic diseases, we hold our health officers largely responsible and expect them to put forth every effort possible to limit or lessen their number. A sordid view of the situation we occupy on this subject would, to an outsider, appear that we valued the lives of adults and every child above one year old away up in the tens of thousands and each one below one year old away down below the tens in cents.

All physicians deplore this distressing and heartless public position which we and all other cities and countries occupy on this vital question. Reading the sentiments of humanity by their public acts, it would appear that unless adults are afraid of contracting some loathsome or dangerous disease themselves or having their business injured by the fear of an epidemic, they will not make any unusual effort to save the lives of their children. Only by the generosity of a few wealthy individuals in a few of our large cities who have distributed free milk of a reliable quality to those who could not afford to buy it for their infants in the hot summer weather, has any effort been made to prevent this alarming summer mortality. As states, cities, or smaller municipalities, we have made no legislative efforts to check this enormous mortality from which the country suffers.

If we apply the mortality results in the State of Michigan, with its two and a half millions of people to the eighty millions of people in the whole country, we find an annual death rate of one hundred and thirty-nine thousand yearly under one year old which could be mostly avoided by educating our mothers to a greater knowledge in weaning and consequently in feeding and nourishing the human family.

RIGHT AND WRONG TIME FOR WEANING.

The proper time to wean an infant is when its nutrition is at the highest point which its mother's nourishment or that of a wet-nurse can produce. This may apply to any age, from the newborn infant to the one about a year old. While in this condition, is the time when all the digestive glands are healthy. There is no fixed age or suitable season of the year in which to wean if the work is done properly. With the very moderate knowledge of mothers regarding the kinds of foods suitable to use at this time, the proper amounts to be fed at each meal and also during every twenty-four hours, physicians consider it prudent, if possible, to avoid making this change during hot weather when all animal foods are prone to rapid decomposition and the infantile digestive power is less vigorous than in the colder weather. Aside from these two factors, weaning is suitable at any season when the nutrition of the infant demands it. It is much safer to effect it in hot weather than to wait for a cooler season if the food now being given is reducing the weight of the child. The age of the infant must not be a factor in deciding this question, for where it is allowed to interfere, the digestive power of the infant is usually so much damaged by waiting that successful feeding thereafter is rendered much more difficult to accomplish.

WHAT MUST GUIDE US IN DECIDING WHEN TO WEAN.

There is no infant so successful as the happy one. Only in this condition do we see proof of the right quality and quantity of the daily aliment. This result can be obtained only by a milk which carries that proportion of fat, proteids, sugar and salts suited to the digestive secretions of that infant.

All mothers are subject to temporary and physical changes during the nursing period. These may show in many ways as acute sickness, menstruation, metal shocks, severe mental strain or unusual physical labor. Any one of these is capable of disturbing the milk secreting equilibrium while it lasts and the inevitable result is unsuitable proportion in the amounts of the fat, proteids, sugar and salts in the infant's food. This always causes a temporary indigestion, as shown by colic, restlessness, disturbed sleep, crying, loose mucus stools, vomiting or foul gassy discharges. Nature has made compensation for these disturbances by giving increased capacity in the different digestive glands to meet temporary emergencies until the improved condition of the mother restores the quality of her milk, after which the infant again becomes happy. During this disturbance, the child either loses weight or fails to make any increase, but these disturbances do not demand weaning.

In the regular female cyclic habit of menstruation, pregnancy or nursing, the time arrives sooner or later when a mother's milk fails either in the quality or quantity. As this comes to all mothers at some time, it behooves us to be on the alert for this change and promptly wean the infant while it is yet healthy and its digestion uninjured. This should always be accomplished before any damage has been done to its digestive glands by trying to digest a milk which is not nutritious, but on the contrary is so irritating and injurious that its use soon injures the digestive glands and prevents or delays the growth of the infant or causes serious sickness. Every change in the infant is quickly recognized by the mother, and when she realizes fully the necessity of weaning promptly in order to secure good digestion and steady growth in her infant, she seldom hesitates in doing it.

The first evidence of unsuitable milk presented by the child is a failure to increase in weight. For many days or even weeks, this may precede the vomiting, foul, slimy green stools, poor sleep, pale face and irritable disposition, caused by this change in food.

It is the duty of every physician to educate the mothers in his charge up to that standard on this subject which protects them against their own foolish and selfish desire to continue nursing an irritating and poisonous milk, and also against the ignorant, though kind advices of their many women friends, who too frequently attribute all disturbances in the infant to teething, whether they occur during the first or the twelfth month of the infant's life. To this foolish, parrot-like advice may be credited the sickness of thousands and the deaths of hundreds in every large city each year.

All mothers should be taught the following facts,—

1. A nursing infant must increase steadily in weight. Failure to do this shows that the milk is insufficient in amount or wrong in quality.

2. When the milk is deficient in amount but contains the proper proportions of good fat, proteids, sugars and salts, the stools are correct in quality but small in size. The infant is hungry all the time and loses weight until it receives more food.

3. When the proportions or quality of fat, proteids, sugar and salts in the milk are unsuited to the infant's digestive secretions, they cause vomiting and green or mixed colored frequent mucus stools. These infants are cross, pale, sleepless, colicky and crying most of the time. They steadily lose weight while the

stools are of the above characters and unless the latter very soon become a healthy yellow color, it is necessary to wean the infant in order to avoid damaging its digestive glands or causing its death.

The difficulties which are encountered in feeding these infants who have been improperly nursed for a few weeks are frequently very great. This strongly applies to errors made during the first six months. Quite frequently, the power to digest fat, proteïd or sugar has been so diminished in this way that one or other of these foods has to be almost eliminated from the substitute dietary before the infant can become comfortable and increase in weight. Many weeks or months of such a light dietary as will give healthy stools are required to repair the damage caused by such unsuitable human milk.

All infants should be weaned under the following conditions:

1. If the mother shows tuberculosis or any chronic ailment by which she is steadily losing weight, her milk will deteriorate in quality, and aside from the fear of transmitting the affection to the child, it is injudicious to continue nursing it, as it does not nourish sufficiently.

2. In attacks of typhoid, diphtheria or any contagious disease in the mother, it becomes necessary to remove the child immediately to avoid contagion by contact. Aside from this influence, it is unsafe to feed the milk from any contagious source. It is unfortunate that these contagious causes demand sudden weaning rather than the gradual way, which is always the safest and most desirable method.

3. Many infants are seriously, and some irretrievably, injured by nursing their mothers during the first few days or weeks of life while she is suffering from some febrile affection due to a septic cause. This may be uterine or mammary in origin, but the result on the infant is always the same. The restlessness, colic, lost sleep and frequent green mucus stools, with consequent loss of flesh, prove the impossibility to nourish an infant with food from the septic source.

4. There are many mothers who make a perfect convalescence from labor and have plenty of milk, yet their infants show continually frequent green mucus stools with little, if any, yellow color. Either the milk is wrong in quality or the digestive glands of the

infant are so imperfectly developed that they cannot digest it. This occurs commonly with the inherited syphilitics, and many demand weaning if specific treatment of the mother does not quickly correct the error.

5. Other children are born to mothers who make an uninterrupted recovery from labor, yet have so little milk that their infants starve more or less from the beginning. These mothers cannot realize that they have not the quality needed, even though the infant continues to nurse them fifteen to twenty minutes each time, nor yet can they see the fault when the stools are deficient in amount. Many of these infants will also have small green ropy stools all the time and yet their mothers, through ignorance, will persist in nursing, though the infants are becoming poorer every day.

6. Occasionally we find an infant six to ten days old suffering continually from hunger, colic and green stools, who, in addition to these distressing symptoms, has a thick pustular eruption covering most of the limbs and body and due entirely to the poisonous character of the mother's milk or unsuitability of the additional food which is given to the little one. This eruption is not born with the infant, but usually commences to show on the fourth or fifth day about the neck and nates. There is no possibility of continuing that diet which produces this intense dermatitis, and death will surely follow unless a correct dietary is quickly adopted.

The above cases show some of the more frequent conditions which demand immediate weaning of infants at different ages.

HOW TO WEAN AN INFANT.

The process of weaning may be either a physiological or a pathological act, acording to the way in which it is done. In any physiological act, the organ used must be healthy and the work demanded must be such as can be done without irritating that organ. This always means that it causes no discomfort to the child.

From this foundation it is evident that all weaning should be done, if possible, while the alimentary tract remains in a perfectly physiological state—that means before unsuitable or pathological human milk has changed any part of it into a pathological condition. Early weaning is then demanded where pathological results show that it is necessary.

It is well known that it always becomes easier to wean an infant as it grows older. This means that all foods are pathological to the infantile digestive glands of the newborn infant except good human milk, and that the increasing number and more thoroughly developed condition of these glands as the infant becomes older gradually renders foreign foods less pathological and difficult to digest and weaning a more physiological process. With these facts as a guide, the undesirability of weaning increases in inverse ratio with the age of the infant.

To do physiological weaning demands an acute knowledge of the natural digestive plan. This, of course, means to know what foods and how much of them are needed at each meal and during every twenty-four hours for infants of different ages and sizes.

Physiological weaning in a pathological digestive tract is certainly more difficult than in a perfectly healthy tract. This argues the following facts: (1) We should always be interested in retaining the natural physiological conditions of digestion; (2) we should give the infant's food our careful attention; (3) we should educate mothers how to do perfect nursing, and failing in that (4) we should teach them how to substitute feeding.

The principles which rule in weaning an infant vary at different ages. The very young infant digests the foreign fat and sugar very well, but he has little capacity for digesting the proteids and starches. After the first month, the proteids can be gradually increased, and after the third month starches can be gradually added to the dietary. Care must always be taken to reduce the sugary diet as the starchy one is increased, as both are digested by the same glands. These general rules are applicable to weaning infants before they have been injured by continuing to nurse unsuitable mother's milk; in other words, to do physiological weaning as perfectly as it can be done with a non-physiological food. In direct proportion with the severity of the pathological condition in the digestive glands will always be the difficulties encountered in weaning an infant. In some, this pathological condition has been advanced so far that there are not enough healthy digestive glands left to convert the amount of food required to nourish that number of pounds which the infant weighs. Such infants always lose a little more every day until death ends the struggle.

Where enough healthy digestive glands are still remaining with which to nourish the infant, a physiological use of them is absolutely necessary for success. As physiological use always means a comfortable infant, it is plain that only those amounts of fat, proteids, sugar and salts must be fed which can be perfectly digested at each meal and thus secure a happy baby and comfortable sleep. If we can obtain these foods from a suitable human milk, the work is physiological and much simplified, but if we are compelled to take them from cow's milk, which, to the human stomach for the first many months, is a pathological source, the work is rendered very much more difficult.

The main idea then in perfect weaning is to keep the digestive glands working in a physiological or comfortable way, knowing that their use in this way strengthens those present and develops more of them, while the pathological or distressing use of them not only injures those that are present, but retards the growth of new ones. To secure this result, all new foods must be commenced in small quantities and increased only as rapidly as comfortable digestion and healthy stools will allow. Usually, the amount of food suitable to an infant two or three months younger is enough to commence with.

No infant should be weaned suddenly unless the exigencies of the situation demand it. If possible, at least two weeks should be consumed in making the change. This will allow one meal to be changed each day, and one or even two days may intervene to prove the correctness of the new food. In this way, only small mistakes can occur and little damage be done to the digestive tract.

The importance of this subject demands that physicians should themselves examine the stools carefully of all cross colicky babies and instruct the mothers regarding the dangers of continuing to nurse the infant when its stools are not correct in color, consistence and number. Many infants are lost during the first month or two through the ignorance of mothers on this vital point.

The mother who is thoroughly educated up to the importance of avoiding green mucus or watery stools in her infant as a security against most of its sicknesses during the first year, has the best prospect possible of seeing that infant grow steadily and become perfectly developed. When she always has this principle as her guide in dieting her offspring of all ages, both in health and sickness, she becomes an almost impregnable barrier against most infantile sicknesses of all kinds. If the day ever comes when physicians have educated the mothers up to this requisite standard of knowledge, then we shall not see more deaths during the first year than we shall see of all ages between one and thirty years, and the prospect will be that the one hundred and fifty thousand infants who die annually from improper feeding in this country would be reduced to a fraction of this number.

RELATION OF FEEDING TO INFANT MORTALITY.*

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AMERICAN FORK, UTAH.

One of the most important problems of pediatrics, which in spite of all efforts and researches still remain unsolved, is infant feeding. About twenty-five years ago it was believed that the constituents of different milks were the same, but existed in different proportions. The problem of infant feeding then was regarded easy to handle. But all the efforts to render cow's milk, the substitute milk generally used for artificial feeding, equivalent to human milk, by reducing its amount of albumen, increasing its sugar, etc., to the same proportion as in the human milk, have been proven useless; the result has not been better. Physiological researches explained the difficulty; the constituents of human milk differed not only in proportions, but also in physiological qualities. If we consider the different rates of growth, the different dominant tissues in the organism, the different digestive systems of an infant and a calf, we must without hesitation admit that the food designed for the infancy of these two different animals should be physiologically different.

A calf as soon as born can stand and run, and in a short time has no need of the food which is furnished from its own mother; while an infant is born helpless, and needs care and maternal food for a long time. The stomach of a cow comprises 70 per cent. of the whole digestive tract, while the human stomach comprises only 20 per cent. of the same. (H. D. Chapin.) The infant stomach does not form a depot. It is adapted to receive only a small quantity; the food therefore should be of easy digestion, and leave the stomach in a short time. The capacity of the stomach of an infant the first month is 90 gms. (3 ounces), and enlarges only three-quarters or half of an ounce every month until one year of age. If we take the capacity of an infant stomach in weight, it is 1-60 of the entire body at birth, 1-40 at the end of the first month, 1-33 at the end of a year, 1-23 in an adult (Biedert.)

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* Read before the Utah State Medical Association, Ogden, Utah, May 10 and 11, 1904.

In the process of digestion and assimilation the cells of the digestive system are active automatically, their secretion and functions are adapted to the food which nature from generation to generation has consigned to them. The cells of the calf's digestive tract should be endowed also with different functions, and should be constructed differently from those of an infant's to assist the digestion of the food of their own race. As statistical tables illustrate, an infant deprived of its natural food is unfavorably situated to maintain its existence, on account of lack of proper food, the food that should correspond to its digestive power and to the need of its constitution.

Statistics of 1830 to 1850 represent an average 188.3 per thousand infant mortality, among infants under one year of age. Statistics of the years from 1870 to 1890, in spite of all the progress in dietetic hygiene, show an increase, 194.4 per thousand (Bertillon). Eroess' statistics of the years 1886 to 1890, made in twelve different countries, among infants under one year of age, present 188.8 per thousand mortality. There were 7,708,000 deaths to 40,833,000 births. If statistics of Russia be added to this the average rises to 214.7 per thousand. Children under fifteen years of age make up one-third, children under five, one-ninth of all the population; so the above mortality comprises one-fourth of entire mortality. In England in the first month of life the infant mortality is 570 per thousand, deaths resulting from congenital diseases, malformation, weakness, injuries during the labor, etc., included. In the second and third months, etc., it decreases gradually to 218, 157, 131, 126, 120, 115, 110, 105, 100, 95, and 90 per thousand at the twelfth month. In New York, according to the statistics quoted by L. Fisher, in the three years, 1890 to 1892, there were 162,721 births. During that time the number of deaths of children under five years of age was 52,213, making the death rate over 320 per thousand. According to Holt in three years, 1890-92 inclusive, the total mortality was 128,136, distributed among the different ages as follow:

Under one year	32,916—26 per cent.
1— 2 years	10,547— 8 per cent.
2— 5 years	9,794— 7 per cent.
5—15 years	69,409—54 per cent.

According to Quetelet, quoted by J. L. Smith, there die during the first month after birth four times as many children as during the second month after birth, and almost as many children as during the entire two years after the first year, although even then the mortality is high. Tables of mortality prove, in fact, that one-tenth of the children born die before the first month has been completed.

Infant mortality increases with the increase of the births (Biedert). In Copenhagen in 1880, in families with 1—4 children the mortality was 226 per thousand; with 5—8 children, 302 per thousand; with 9—12 children, 495 per thousand. Schweig gives the following report in this respect from the province of Baden; if the births were 21 per thousand of the entire population, the deaths of infants, under one year of age, were 21 per thousand of the entire mortality; if the former was increased to 25, 36, 53 per thousand the mortality increased to 22, 27, 26 per thousand of the whole.

Illegitimate infants in all countries present the highest mortality, on account of lack of maternal food and care. Bertillon says: "It is a crime. One has no courage to kill the infant, but one lets it die gradually by starvation and neglect." Statistics of the years 1881-85 and 1890-95, collected in five different European countries, presented a mortality of 310 per thousand, against a mortality of 185 per thousand among legitimate infants of the same age. Majer gives from 600 to 750 per thousand mortality among the illegitimate infants of some Bavarian districts.

Nearly the same condition prevails among infants whose mothers are obliged to work out of their houses. Villerme pointed out, that during the years 1823-24 half of the children of merchants, manufacturers, and engineers reached the age of twenty-nine years, while half of the children of women working in textile industries and living in the same districts, died before having reached their second year. Nearly the same condition prevails in all European manufacturing districts.

Among infants of the poor classes the mortality is likewise higher. In Berlin, Germany, among the children of the rich classes, under five years old, the mortality is 57 per thousand; that among the poor classes is 357 per thousand, about seven times as much. Clay has pointed out that in Preston at the end of the first year, of 100 infants of gentry, born alive, 90 were living; that of merchants 79, and of the laboring classes only 69. Wolf gives the following statistics from Erfurt. Out of a thousand infants born alive the mortality may be tabluated as follows:

Age.	*Illegitimate.*	*Laboring Class.*	*Middle Class.*	*High Class.*
Under one year......	352	305	175	89
1—2 years..........	55	115	55	19
3—5 years..........	42	136	65	26

He further pointed out that, where one infant of the rich classes dies from gastro-intestinal diseases, from the middle and laboring classes 2—2½ die; from illegitimate infants, 7½. As an interesting fact in this regard it may be mentioned that in Erfurt, Germany, during the year 1851, in which the prices of victuals were low, infant mortality was 194 per thousand, while in the year 1855, when the prices of victuals were very high, the mortality increased to 249 per thousand. In Finland during the bad crop years of 1867 and 1868, the infant mortality was 220—390 per thousand, while the average mortality in the years 1865-66 and 1869-77 was 165 per thousand. (Biedert.) In all the large cities of the world, such as Rotterdam, Prague, St. Petersburg, New York, Berlin, Budapest, Breslau, Copenhagen, Chicago, etc., infant mortality is highest among the poor classes.

Among the inhabitants of the overcrowded districts of the large cities infant mortality is again highest. In Leipzig in the localities where there is one room to each infant, the mortality is 101.1 per thousand; in the localities where there is one room to 2—2½ infants, the mortality is 330.6 per thousand; it is 416.9 per thousand where there are three children to one room. In Vienna the lowest infant mortality, 141—232 per thousand, is in the districts where there is one room to 0.83-1.32 persons, while the mortality increases to 406—429 per thousand in the districts where there are 1.94—2.10 persons to one room. In this matter, according to Biedert, the chief acting factor is rather poverty than the unhygienic circumstances of the place, since among the relatively well-off laboring class, who live in unhygienic places, such as cellars, etc., infant mortality is lower than among the poorer classes who are living in relatively more healthy places.

During the year the maximum infant mortality is in the hot summer months. This is, however, caused mostly by spoiled and contaminated food, since food spoils easily in hot temperature. (Biedert.) In Prague, Austria, where every woman nurses her own infants, the hot summer season does not show any increase in infant mortality. In Berlin during the hot summer months infant mortality is twenty-one times greater among infants artificially fed than among breast-fed infants; the average through the whole year is only eleven times greater, and it reaches its climax in July, when the mortality of the artificially-fed infants is twenty-five times higher. According to Biedert's statistics from Hagenau, Germany, in the years 1885-90, 64 died of gastro-intestinal diseases in May, 89 in June, 129 in July, 182 in August, 251 in September, 182 in October. The average death in every month is 52. In France, of 12,000 deaths among infants under one year of age, 5660 (about 50 per cent.), happen in the four summer months, beginning with July. In Berlin, in the districts where the poor classes live, the summer months show five times greater mortality among infants under one year of age than in the other districts.

Deaths by gastro-intestinal disturbances, called by laymen, cramps, teething, convulsions, weakness, etc., according to Biedert, comprise the 100—530 per thousand of the infant mortality. A reliable report from Wolf shows 600 per thousand of infant mortality in Erfurt. C. Meyer gives the following statistics from the district of Allerhausen, where the diagnoses were made by the physician. Seven hundred and ten out of 1000 infant deaths were from gastro-intestinal diseases, 50—280 out of 1000 deaths from diseases of respiratory organs, 70—240 out of 1000 deaths from infectious diseases. He further points out that in Bavaria, the higher infant mortality is, the higher is the percentage of deaths from gastro-intestinal disturbances.

In all countries the mortality among the artificially-fed infants is high. Bertillon reports from Loire Inferieur, 900 per thousand mortality among artificially-fed infants under one year of age. In whole districts, out of 100 deaths in infancy, as examination showed, only eleven were breast-fed during life. Of 1943 fatal cases from digestive disturbances, collected by Holt, only 3 per cent. had the breast exclusively. He says: "In my own experience, fatal cases of diarrheal diseases in nursing infants are extremely rare." Smith quotes the following: "On the continent, in Lyons and Parthenay, where foundlings are wet-nursed almost from the time that they are received, the deaths are 337—350 per thousand. On the other hand, in Paris, Rheims and Aix, where foundlings are all artificially fed, at the date of the statistics, their deaths were 502,639—800 per thousand." He further states that, "In New York foundlings, numbering several hundred a year, were formerly artificially fed, and, incredible as it may appear, their mortality with this mode of alimentation reached nearly 100 per cent. Now wet-nurses are employed for a portion of the foundlings, with a much more favorable result." Holt says: "In my own experience it is extremely rare to find a healthy child who has been artificially fed from the birth, who has been reared in a tenement house." He further says: "The largest number of deaths in the first year are due to diseases of the gastro-intestinal tract and marasmus." In Berlin the deaths among artificially fed infants in the years 1891-92 averaged 9.4 times more, and in the first seven months 11.4 times more than the deaths among the breast-fed infants.

We see from the above statistical facts that the greater the difficulty to procure a suitable food for the infants, deprived of their natural food, the higher the mortality rate. The circumstances not under the control of the mother, such as poverty, unhygienic buildings, inability to procure high-grade milk, and to follow directions in preparing and preserving it on account of the number of children in the family, or occupation out of the house; and again, the ignorance and negligence on the part of the mother or nurse combine to produce the "race suicide" of our civilization. It sounds incredible that a healthy born infant should die from lack of proper food. The old master, Hippocrates, said: "Food is not food, if it does not nourish." The food for the use of infants should repair the waste, supply material to build up new tissue, and furnish force and heat for the functions of the organism.

At the present time the general substitute food for human milk is cow's milk; it can be procured everywhere and is within the reach of all. There has not been produced, however, yet, a standard modification of cow's milk which would correspond to the need of the infantile organism, and be adapted to the power of its digestive system. As I mentioned in the beginning briefly, human milk and cow's milk,—judging from pure reasoning and also scientific facts,—should be differently compounded bodies, to correspond to the different rates of growth, to different capacity of the digestive systems, and to different proportions of the animal tissues in the organism of their offsprings.

In the first place the ingredients of cow's milk, the albuminoids, the fat, the sugar, etc., represent different proportions from those of the human milk; of albuminoids cow's milk contains 3.55 per cent., the human milk 1.50 per cent.,—about three times more; of fat both milks contain about equal parts,—cow's milk 3.69 per cent., and the human milk 3.30 per cent. The human milk contains about twice as much sugar (6.8 per cent.) as the cow's milk, which contains 4.8 per cent.; of inorganic salts cow's milk contains 0.70 per cent., the human milk 0.20 per cent.,—about three times more.

By these chemical facts, however, the question of how to modify the cow's milk for the use of infant feeding is not wholly finished. The most important matter, the utilization of its ingredients in the economy of infantile organism, remains yet for the researches of the future. Chapin says: "It is useless to attack the problem of artificial infant feeding from the standpoint of chemistry alone, although a knowledge of food chemistry is of great importance. What is needed is a knowledge of substances that have proven to be able to support life and produce healthy tissue; how to combine and adapt them to suit the needs and the digestive system of the infant."

One of the most important ingredients of the milk which is utilized in the organism of the infant to repair the waste and supply materials to build up new tissues, is the albumen. The fat and the sugar are partially used, if necessity arises in the household of the organism, as substitutes for the albumen, but they are mostly used as force and heat producers. Biedert sees the most important differences in both milks in the albumen. He says: "I observed closely ten years the breast-fed infants and also the infants who were fed with cow's milk or with other infant foods, and I always noticed a great difference in the condition of health and growth, and in their stools. One must keep always in mind that from the unyielding cow's milk *casein* should be given as much as it can be borne by the infants." In the following I wish to point out some of the important facts in regard to the difference of albumen in both these milks.

As we know from physiology, the albumen transforms into *peptone,* a soluble compound, by the action of the stomach juice. Milk curds in the stomach before it can be changed into peptone by the presence of a *lab-ferment,* parachymosin. The lab-ferment of human stomachs, parachymosin, is a far more susceptible body than the chymosin of calf's stomach; the former loses its curd-forming power by adding alkalis, or by heating, to a greater extent than does the calf's chymosin.

By adding a small quantity of fresh human stomach juice to human milk there form curds, and by adding to this sufficient stomach juice, to equal in quantity the milk, the curds formed will be dissolved completely. In contradistinction to this, the curdling formed by the addition of fresh human stomach juice to cow's milk remains the same, no matter how much of stomach juice is added. According to Bruecke, different kinds of albuminoids demand varous amounts of pepsin; albuminoids of human milk require relatively the less quantity. Among the different albuminoids, fibrin, legumin, etc., the caseins are easiest to digest. The fat, which is suspended in the milk as microscopic drops, is embedded in the meshes of the curds, and makes them very loose and flocculent. Human milk containing relatively small amounts of albumen and large quantities of fat divides its curds in the finest flakes. The attempts, however, to render the curd of cow's milk as fine as that of the human milk, by diluting to 2:1, 1:1, 1:2 with water, or adding different agents, such as soda chloride, soda carbonate, or coagulating the milk first and shaking it to fine particles, etc., have been proven useless. (Vogel, Kuttner.)

One of the chief characteristics of the cow's milk casein is that it curds in the acids, while the human milk casein remains unchanged. According to Biedert's experiments, in alcohol and in tannic acid both caseins were equal in chemical changes. In the following agents, 0.4 per cent. or concentrated hydrochloric, nitric, sulphuric, and phosphoric acids, 20 times diluted or concentrated lactic, acetic, tartaric acids, in calcium chlorate, magnesium sulphate, lead acetate, bichloride of mercury, human milk is never or with great difficulty curdled. On the contrary, in these reagents the curds of human milk dissolve; with these reagents the cow's milk casein curdles and remains so.

Beside the consistency, both caseins differ in their color and reactions. Human casein is light yellow when it is wet, brown when it is dry, the cow's milk casein is white when it is wet, light yellow when it is dry. When they are wet the reaction of the human casein is alkaline, that of cow's milk casein is acid. Only 1-20 part of the dried and powdered cow's casein is soluble in pure water, while with human casein the great part could be dissolved. During the extraction of fat in ether, the human casein swells and turns jelly like, and makes its separation impossible, while the cow's milk casein remains unchanged.

According to Reichmann's and Escherich's observations no albumen of the human milk passes the infant stomach without being digested. Van Putrin proved that the digestion in the stomach of breast-fed infants takes place relatively in short time. Nearly always the stomachs of breast-fed infants were entirely empty in 2-2, 1-3 hours after the feeding, while those of cow's milk-fed infants were found empty in 2-3 hours or longer. Biedert proved that the stomachs of the breast-fed infants were always empty in 2 1-3 hours after the feeding, and according to forty-six examinations of three cow's milk-fed infants—1½, 5, and 6 months of age,—made in 2¼, 2½, 2¾, and 3 hours intervals after the feeding, it was found that the stomach was entirely empty, in three hours, two times; thirty-two times there were yet undigested curds in different quantities, two times there was yet a great amount of the curds. According to C. Bernard, the rest of the albumen, which passes the stomach undigested, is digested in the lower part of the intestines, by the action of the pancreatic juice. The action of the pancreatic juice, however, is impaired in the acid reaction of the contents. The breast-fed infants are protected against this by the complete digestion of the albumen in their stomach. When the infant grows older the quantity of the pancreatic juice becomes larger and it meets the undigested albumen in the lower part of the intestines, where the reaction becomes more alkaline. But in the lower part of the intestines there is great danger that the undigested albumen will fall a prey to the decomposing microorganism.

Escherich found the micro-organisms in the contents of the intestines of new-born infants, 3-7 hours after the first respiration; they are carried by the air first to the mouth and from there to the digestive canal. After the first feeding which drives out the congenital contents of the intestines the predominant micro-organisms are bacterium lactis aërogenis in the upper part, and bacterium coli communis in the lower part of the digestive tract. Bacterium lactis transforms the milk-sugar into lactic acid, carbon dioxide, and hydrogen. Bacterium coli, which can exist in every reaction, acid or alkaline, produces chiefly butyric acid from the neutral fats. (Biedert.)

By sterilizing foods the existence of the micro-organisms is not checked. Eberle found 32,000,000 micro-organisms in one milligram, about one-sixtieth of a grain, content of the intestines, in spite of sterilized food. Langermann found in one cubic centimeter, about half a cubic inch, content of the stomach of a normal digesting cow's milk-fed infant from 3700 to 240,000, in that of breast-fed infants, from 6900 to 29,000, and in that of a sick infant millions and millions of micro-organisms. In the presence of free hydrochloric acid, which has a germicidal property, still from 3200 to 6400 micro-organisms were found in the same amount of stomach content.

It is demonstrated that in cow's milk-fed infants there is always more or less putrid decomposition of the albumen in the intestines; even in well digesting and healthy cow's milk-fed infants the existence of putrid decomposition can be proven by the presence of *indican* in the urine. This is the reason why the stools of cow's milk-fed infants smell like rotten cheese. A. F. Marfan gives the origin of putrid decomposition "incomplete utilization of cow's milk casein." According to the examinations made of ten breast-fed and seventeen cow's milk-fed infants, the stools of the cow's milk-fed infants contain three times more N than those of breast-fed infants. If the amount of N which would originate from the gastro-intestinal secretions be abstracted, still two-thirds of the N would originate from unutilized casein of cow's milk. Breast-fed infants are well protected against putrid decomposition by existence of the acids (hydrochloric, lactic, and butyric acids) and by complete digestion and assimilation of the albumen. The contents of the gastro-intestinal canal of breast-fed infants to the end of, and even after digestion, have acid reaction.

According to Wegscheider there is no remainder of casein in the stools of breast-fed infants.

Gentlemen, as we see from the above stated facts, from the standpoint of chemistry and physiology, the difficulty in artificial feeding, and the main cause of the gastro-intestinal disturbances of cow's milk-fed infants originate from the unyielding albumen of cow's milk. The future of the infant feeding depends to a great extent upon the adaptation and utilization of foreign albumen in the digestive system of infant.

But this, unfortunately, is not the only difficulty to be overcome to produce a proper infant food. One of the greatest of other difficulties is to produce and to supply wholesome cow's milk for the use of a large mass at a price that will put it within the reach of all. Bacteriological and chemical examination of milk, which is furnished as infant food, gives us an idea as to its unfitness for feeding. Prof. H. W. Conn, of Wesleyan University, states as follows, "The milk that is supplied to our cities frequently contains more bacteria than are present in city sewage, and in the case of unusually bad samples of milk the number of bacteria outnumbers that which is found in the worst sewage." If we consider only that one gram, fifteen grains, fresh soil contains 100,000,000 bacteria, and one gram cow's manure as many as 375,000,000 bacteria, and on a little scab of cow's udder and hairs exist several hundred of bacteria, and also if we consider that one single bacterium, in a temperature of body heat, in six hours increases to 3880 bacteria, we shall realize how easily a milk supply may be contaminated and how difficult is its handling. On the other hand the milk at home, after being delivered, is subject to farther contamination at the hands of ignorant and negligent mothers or nurses, by the bottle, nipples, spoons, strainer, etc. The bacteria not only by decomposition destroy the albuminoids of the milk, but also produce toxic elements, which act very injuriously on the general constitution and especially on the mucous membrane of the gastro-intestinal tract.

THE YEAR'S PROGRESS IN ORTHOPEDICS.*

BY NATHANIEL ALLISON, M.D., OF ST. LOUIS.

THE NON-TUBERCULOUS JOINT DISEASES.

For a number of years the medical mind has been dissatisfied with its understanding of the so-called rheumatoid diseases, a dissatisfaction which has increased by the knowledge that the nomenclature used gave no common ground on which to explain or exchange ideas. It is certain that very many different conditions have been called by the same name, and it is also certain that the same condition has been given very many different names. In order to establish some system in this chaos many have been working; the vast number of joint conditions known as the non-tubercular joint diseases have been grappled with on all sides; pathology, bacteriology, chemistry and the Roentgen rays have, on the whole, helped much, though at times their evidence has been contradictory. We must be rid of such terms as "chronic rheumatism" and "gout," used to designate affections varying from infection of a joint by the gonococcus to Heberden's nodes. During the last year much has been done in the way of putting forth knowledge accumulated in the clinic and laboratory during the last decade, and the number of articles, as well as the different fields of work represented by the authors, testify to the fact that the light is coming through; that after a few minor points are settled the work may go on aided by mutual interest and understanding.

Goldthwaite[1] divides the field into five types, and has given us the essential characteristics of each type; briefly they are as follows: The first, *the chronic villous arthritis,* or "dry joint." This is a local process with no tendency to progression, and is usually seen in the knee. Crepitation or cracking of the joint on motion, pain and tenderness on use, catching and even complete locking at times, with increase in the joint fluid, are the symptoms. The condition is the result of strain and weakness, the joint membranes become lax and congested, are thrown into folds, which, being rubbed over each other, become more swollen and fringes or villi result; these in turn undergo fatty degeneration and lipomata are formed, or calcareous degeneration may take place and the bony or cartilaginous masses known as "joint mice" develop.

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* By courtesy of the editors of the Interstate Med. Journal.

The second type, *atrophic arthritis.* The etiology of this type is not known; it is a progressive disease, resulting in marked crippling and distortion, in which the essential pathological feature is atrophy, an atrophy which involves the joint membranes, the cartilage and the bones. Many joints or only one may be involved; the disease may extend gradually for years. The finger joints are usually involved early in the course, and the middle row of phalangeal articulations is first affected, spindle-shaped swellings with pain and stiffness, resulting in distortion and ankylosis.

The third type, *hypertrophic arthritis.* In this class the bones are thickened, this thickening taking place at the edges of the articular cartilages or at the attachment of ligaments. The formation of ridges or nodes which become ossified and interfere with joint motion is the essential feature of this type. In the finger joints Heberden's nodes typify the process. It may be local or general; the spine is frequently the seat of the disease, and the fusing of the vertebræ and intervertebral discs may be so complete as to result in ankylosis. During the active or irritative stage of this condition pain of extreme and persistent character is present; it is usually referred pain, due to pressure on a nerve, such as sciatica, intercostal or brachial neuralgia. Exposure to cold, strain and injuries are undoubtedly factors of importance in the etiology of this type.

The fourth type, *infectious arthritis.* With this type of disease the symptoms are those of infection, varying in severity with the organism of infection. There is local inflammation, the joint is swollen, the capsules thicken, but there is no change in the cartilage or bone unless the process is of a destructive nature. The organism may be present in the joint, or as in the case of the typhoid bacillus, the joint process may consist of simply a toxemia. These cases may result in adhesions, weak, unsteady joints, or where the process is destructive there may be true bony ankylosis.

The fifth type, *chronic gout.* This is a rare disease, the pathology of which is little understood. The essential characteristics are the deposits of urate of soda in the soft structures about the joint, and some bone absorption adjacent to these deposits.

Here we have a definite field divided into five sections; the only difficulty remaining is to classify the individual case and place it in its proper square. That there may be difficulties in doing this is evidenced by the fact that Bradford[2] writes that where as yet we know nothing absolutely of the pathological process, he considers it better to use a single name for all these conditions—excepting, of course, infectious arthritis due to a known bacterial agent—and suggests as a name *"arthritis deformans."* He considers this name better, as it does not assume a pathological basis and does not prevent necessary subdivisions. He promises us a full report on a long series of autopsy findings in the near future; he is being aided in this work by E. H. Nichols.

McCrea,[3] in an analysis of 170 cases, has gone over the pathology and etiology of arthritis deformans in a thorough manner and has made some interesting discoveries. As to the age of onset he found that in 70 per cent. the onset was before forty years of age, and that in 50 per cent. it was before the age of thirty. This is clearly against the idea that these joint affections are the lot of old age. He came to the conclusion also that there are two great types of cases, the atrophic and the hypertrophic, which are varying manifestations of the same disease.

Morse[4] has written that in childhood the atrophic and the hypertrophic forms of arthritis are rarer than in adult life, as is shown by the literature, Koplik being able in 1895 to collect but eighteen cases, and Moncorvo, in 1901, but forty-eight cases. Undoubtedly many other forms of disease were included in their series of cases. The disease described by Still in 1896, and known as Still's disease, he classifies with infectious arthritis.

Poynton[5] has shown us how confusing the lack of a definite nomenclature is; he calls attention to the fact that we need to simplify our terminology. It seems that this would apply more especially to English writers on this subject, for in the British journals the confusion is so great that it is difficult to get any definite impressions.

Though the pathology of these affections, as well as the etiology of most of them, is still an unknown quantity, though many bridges must yet be built to carry us over differences of opinion, we have the comfort of realizing that the needed treatment has been made much clearer, and that the prognosis under treatment and without treatment is also clearer. Whatever ideas an individual may hold as to the scientific side of these cases, he must admit that the therapeutics have made a wonderful advance. Skinner,[6] Goldthwaite and Kolipinski[7] have written excellent papers on the treatment. It is to be hoped that the attention of the profession in general will continue to be directed toward these cases and that, as in the case of the kidney, we shall come to a thorough knowledge of the lesions down to all possible refinements, and that no longer such a term as "chronic rheumatism" will be applied to the many different diseases of the joints.

Chute[8] has pointed out the importance of making a diagnosis of hypertrophic arthritis of the spine in cases of urinary disease; many patients with supposed hypochondriasis or neurasthenia have had cause for their pain, and have recovered when proper treatment has been applied to their spines.

CONGENITAL DISLOCATION OF THE HIP.

In order justly to criticize an operation having the character of the Lorenz operation for congenital dislocation of the hip, it is necessary that the element of time play a part. It has now been two years since the visit of Lorenz to this country, and during the last year reports of most of the cases that came under his hand have been given to the literature. Papers have been written which have called out the best opinion in America in animated discussion. Adverse and favorable criticism both have been unrestrainedly expressed. The Lorenz operation has been placed under a microscope, as it were, and examined carefully, and on the whole with fairness by those best able to appreciate its advantages and disadvantages. It would be strange if opinion were not affected by certain unpleasant characteristics of the tour of Lorenz through this country, but it is not evident in any of the critical discussions that have arisen on this subject that opinion has been materially influenced by personalities. The visit of Lorenz was the stimulus which has brought out the statistical reports and supplied us with the definite knowledge on this subject which was so much needed.

From the orthopedic staff of the Boston Children's Hospital[9] has come a complete report of all the cases of congenital dislocation of the hip at that institution since it has been recognized that something could be done for these cases. This report covers a period from 1884 to the present time, and is based on the observation of 144 cases. It includes ten cases manipulated by Lorenz, and shows the results of all known methods of treatment. It shows, too, how success has added to success, and increased the field of usefulness of operation for this condition. Between the years 1884 and 1896 twenty-one cases were treated, seven by mechanical appliance without operation, twelve by open operation and curettage (Hoffa's early operations—two of them by Hoffa himself), and two by manipulation under an anesthetic. All twenty-one were failures. Between the years 1896 and 1902 fifty-four cases were operated upon; thirty-four of these were cut down upon with eleven successful, six unsuccessful and seventeen unknown results. Twenty were manipulated with one success, seven failures and twelve unknown results. In the year 1902 twenty-two cases came to operation, an excess of one over the entire number treated in the twelve years before 1896. Of these twenty-two, two were operated upon by an open incision and were both failures. The remaining twenty were manipulated, half of them by Lorenz himself. The results were eight successes, two failures, three relapses and seven transpositions. In the year 1903 thirty-three cases were operated upon. On twenty-four of these a machine was used to aid stretching. The results were sixteen successful cases, five transpositions and three failures. Eight cases were mainipulated with six successes, one transposition and one failure. One case was operated upon by the open method and was a failure.

Enough time has elapsed to make these results trustworthy, and most of the cases have been verified by skiagrams and the careful examination of unprejudiced observers.

The gratifying improvement in results here noted needs no further comment. Attention may be called to the fact, however, that there has been a steady gain on the side of manipulative methods as against the open operation. The broad view of this subject taken by the group of men making this report is apparent in this paragraph taken therefrom: "There is a certain analogy between the treatment of congenital dislocation of the hip and that of club-foot. In the simple cases manipulation under an anesthetic is sufficient. In the more resistent cases correction is helped by mechanical aids. In the oldest and most complicated cases incision and osteotomy are often needed to perfect the cure."

Bradford, by long years of patient energy and devotion to this branch of orthopedics, has been able to give to us with the aid of his associates this valuable epitome. The mechanical stretching referred to in this report was accomplished by the "Bartlett machine," or the "Boston machine," an instrument devised by Mr. Ralph Bartlett, an attorney. This machine is a powerful traction windlass, so constructed that its outside bar presses directly on trochanter major. With it powerful traction is applied, the limb is pulled down, then the machine is abducted with the limb and the head lifted directly into the acetabulum. Bradford[10] attributes the success attained in many cases to this contrivance, and has published a description of it during the year.

Ridlon,[11] in an article on the ultimate results of the bloodless operation, has taken up the claim of Lorenz that 80 per cent. of the manipulated cases show good functional results and that over 50 per cent. of the cases show anatomic reposition, and states that the anatomic replacements are not in excess of 20 per cent., and that the claims of Lorenz have led to bitter disappointment and unjust condemnation of earnest and skilful operators. He also gives to Paci, of Pisa, the credit of originating the operation, and is apparently of the opinion that what Lorenz has added to the method of Paci is of little importance. His statements on percentage of success are based on the observation of 159 dislocated hips, ninety-four of which had undergone the manipulative treatment. Of these ninety-four ten showed perfect anatomic replacements. Lorenz himself operated upon twenty-nine of these with the following results, according to Ridlon's report: Seven failures, thirteen anterior transpositions, six supracotaloid displacements and the remaining three doubtful successes. He accounts for this difference in results with the claimed results of Lorenz as being due to the conditions under which Lorenz operated, and also to the fact that most of the cases did not receive proper aftertreatment.

Lorenz[12] has written a paper which in part answers these criticisms, though he does not take up the discussion openly. He goes over the old ground, and states that he can see no way in which to improve his operation; that he does not approve of a machine to aid in stretching the contracted muscles; that too much importance should not be attached to the skiagrams of cases, for it is not uncommon for the skiagram to fail to coincide with functional results. He does not believe that the age limit can be raised, and closes his paper with the significant phrase, *nil perfectum sub sole.*

Mueller,[13] the assistant of Lorenz when he travelled over the country, has taken up the statements of Ridlon openly, and first says that no one should confuse the methods of Lorenz and Paci, inasmuch as they are different, *vide* the fact that Lorenz reduction is accomplished by "ultraphysiological abduction," the head thus entering the acetabulum over its posterior rim, whereas the Paci movement brings the head in over the inferior part of the rim. He claims that the statements of Ridlon regarding percentage of anatomic restorations were made prematurely, and further states that he was able to recognize three cases that were reported in the Ridlon statistics as anterior transposition as being cases in which he conducted the after treatment and obtained anatomic repositions.

Hovath[14] has reported fifty-seven cases. Fourteen of these were anatomic replacements, twenty-one were anterior transpositions with good functional results, fifteen are still under treatment, ten were failures to reduce, nine relapsed and eleven were lost track of.

This last year has been full of highly instructive reports and progressive work on this important branch of orthopedics, and the results shown are very encouraging. It does not seem visionary, considering what has been done, to look forward with assurance to a day when the cases that are irreducible have closely approached the vanishing point.

TUBERCULOUS HIP DISEASE.

The most noteworthy piece of work on this subject has come from France. Cabot[15] (in a 230-page book) has taken up the subject thoroughly, going into all the refinements of diagnosis and treatment. Although there is nothing startlingly new or original in the book, there is much of interest; as, for instance, the chapter on the aspiration of hip abscesses and the chapter on osteotomy. The application of the plaster of Paris spica—the method of treatment preferred by the author—is described in the most painstaking way, and is full of valuable hints which might be applied to plaster of Paris treatment in general.

Freiburg[16] has recommended an appliance for bed traction, the virtues of which are that the limb is held steady, and that the weight acts in extension practically as well as in theory. The only possible objection to the apparatus would be its cost. Freiburg[17] has also called attention to Bier's "congestive method" in the treatment of joint tuberculosis, and has reported three cases where he employed the method with very satisfactory results. He recommends the method as an adjuvant to the resources long at our disposal. The technique of the treatment is to apply to the diseased joint a bandage which produces constriction and hyperemia. The congestion thus obtained should never be allowed to pass beyond the hot stage, and the patient should feel no pain whatever. The treatment should not be applied for more than an hour daily.

POTT'S DISEASE.

Taylor [18] and Throndike,[19] writing independently, have called attention to the fact that statistical data on the question of the increase or improvement in deformity in Pott's disease is meagre. In the opinion of both of these observers more attention should be paid in dispensary practice to the recording of increase or diminution in the kyphos, and the jacket should be applied to the individual with due consideration of his own response to correction. The stimulation of interest along these lines will do much to improve the mediocre results that are now being obtained. Young[20] has described a very efficient apparatus for the treatment of upper dorsal and cervical Pott's disease. This consists of a cuirass made of felt or celluloid, which is constructed on a cast of the child's back; the mould for the cast is taken with the patient lying face down on a canvas hammock; the head, neck and trunk are included. The patient is secured in this by broad webbing bands. Wullstein,[21] in an elaborate article on the treatment of Pott's, recommends an appliance very similar to this. He corrects the deformity on a machine, however, and applies a plaster. Using this plaster as a mould, he makes his celluloid appliance, but joints it so that a greater or less degree of correction may be secured by screws at the will of the surgeon.

SCOLIOSIS AND ROUND SHOULDER.

Hoke[22] has operated for the deformity, and his work (which involved many careful experiments, the designing of many special instruments, and a series of operations on the cadaver and on animals) ended in a practical improvement which could not have been obtained in any other way. His operation, in brief, was to divide the ribs on both sides and remould the deformed thorax to as nearly the normal conformity as possible. The difficulties encountered, the patience displayed on the part of the patient, and the ingenuity of the operator all go to make this a remarkable piece of work. The operation would only be suitable in cases where the osseous deformity was evidently of such a nature that exercises and jackets could accomplish nothing. Lovett[23] has written again on the element of torsion in scoliosis. His method for applying corrective jackets is in theory the best, and practically, also, as shown by his results.

Lovett[24] in an article on the forcible correction of round shoulders, describes an apparatus which exerts an accurately applied lever force in such a manner that there is no escape therefrom, the only question being how much correction is safe. He states that some mechanical stretching is necessary in round shoulders, the hope being to restore the dorsal spine to a more normal range of hyperextension and then to educate the muscles to hold the improved position.

PARALYSIS.

Poliomyelitis has been approached by Spitzy[25] on the side of nerve grafting, and an interesting field of speculation opened. He has given us the technic of his laboratory operations in neuroplasty, and suggests that as nerve grafting is a method of operative treatment which does not interfere with other methods of treatment practiced, it should be given a trial. That it may result in return of power, Cushing[26] has demonstrated in an anastomosis of the facial nerve for facial paralysis. Young[27] reports a case of paralysis of the anterior tibial muscle which was benefited by an anastomosis of the musculo-cutaneous with the branches of the peroneal nerve which supply the anterior tibial muscle. He calls attention to the necessity in an operation like this for anatomic exactness and precision in recognizing the nerves.

Dane and Townsend[28] have published a series of fifty cases of paralysis of the lower leg (poliomyelitis) operated upon by several men, a sufficient number of years having elapsed since operation to justly judge the results. Tendon transplantation, arthrodesis and astragalectomy were the operations done. The results would seem to show that tendon transplantation is not so satisfactory, except in carefully selected cases, as astragalectomy or arthrodesis.

Hoffa[29] writes that to get good results it is important to obtain the highest possible tension on the grafted tendon in an overcorrection of the deformity, and to do this it is always better to correct the deformity before the operation. He recommends the following new operations: In spastic contracture of the forearm, in order to overcome pronation, change the pronator radii teres into a supinator by transferring its origin from the internal condyle to the external condyle of the humerus. Transplant the trapezius to the position of a paralyzed deltoid in paralysis of the shoulder joint.

Gibney[30] reports the removal of the tensor vagina femoris in a case of spastic paralysis in order to correct internal rotation which could not be overcome by other procedures. The operation was at the time of report a success, but lapse of time will be necessary to judge its permanent effect. Clarke[31] reports a case where he cut out on each side about an inch of the adductor longus and gracilis, with parts of the adductor brevis and magnus; also parts of the hamstrings and tendo Achillis for the relief of contractures in spastic paralysis. He thus secured a considerable relaxation of the stronger muscle groups and the case was much improved. Tubby[32] has given a report of successful muscle grafting for paralysis. In the case reported the serratus magnus was paralyzed. He took a large part of the sternal portion of the pectoralis major, dividing the humeral attachment of this, the end was sutured with silk into the paralyzed serratus, with the result that power returned to the serratus. He has reported only one case, but the suggestion is a valuable one.

FOOT ERROR.

A statement from such a man as Gibney[33] carries with it an irrefutable amount of weight, even if it be of a revolutionary character regarding the character of congenital talipes equino varus. Gibney has written that, in his opinion, the treatment in these cases has been begun too early; that until the foot becomes a weight-bearing, walking apparatus attempts at correction and cure are of little avail, the results obtained not justifying themselves when placed in comparison with the pain and disturbance consequent on the treatment in young children.

Blodgett[34] has done one of the best pieces of work that has been attempted during the year. Up to the time of the appearance of this paper there were no reliable statistics on the subject of static foot error. He has gone over the treatment and the results of one thousand cases of flat foot, and put his conclusions into such form as to be easily available. His work covers three years and is decidedly praiseworthy. Some of the interesting points brought to light are: (1) That 40.8 per cent. of orthopedic cases have static flat foot; (2) that two-thirds of the cases were under forty years of age; (3) occupation is shown to play an important part in the etiology; (4) cases are most frequent in the summer; (5) pain is most commonly localized at or near the astragalo-scaphoid articulation. As to the results of treatment, plate treatment was the most efficient: 32.7 per cent. were entirely relieved, 44.9 per cent. were relieved, 7.8 per cent. were slightly relieved, 13.6 per cent. were not relieved, .1 per cent. was made worse. The fact that it is necessary to change frequently the form of support—no matter whether it be plate or plate substitute—is clearly demonstrated.

Bradford[35] has written on the relation of boots to humped foot or metatarso-tarsal valgus, and has shown that constricting shoes are responsible for this condition. The human weakness that prompts the buyer to purchase small and injurious shoes is responsible for this deformity and the remedy is readily prescribed, but not easily applied.

COXA VERA AND FRACTURE OF THE FEMORAL NECK.

Whitman[36] has called attention to the distinction between fracture of the neck of the femur and epiphyseal disjunction in early life. He divides the cases into three classes: (1) Simple, direct fracture of the neck, usually incomplete, occasionally complete. This class should be treated by putting the limb up in a plaster of Paris spica at the limit of normal abduction. (2) Direct epiphyseal disjunction, usually incomplete, in rare instances complete. These cases should be operated upon and the head replaced. Removal of the epiphysis should only be done in case of necessity. (3) An indefinite class, in which the deformity is at or in close proximity to the epiphyseal junction. Those patients are of a class that have so-called static deformities of adolescence, and injury here is probably an aggravating rather than a direct cause of distortion. Under this head coxa vera is included. Excision of a wedge at the base of the trochanter is the operation here to be employed.

Hoffa[37] states that epipyseal separation is often mistaken for hip disease. He is inclined to place all cases of coxa vera under the head of epiphyseal disjunctions.

Moore[38] has written of his method for obtaining a bony union in fractures of the femoral neck in aged persons. He reports several very successful cases, and states that the reason why this class of patients is regarded as being beyond surgical aid is due to the fact that the proper kind of treatment has never been applied except in exceptional instances. There is nothing in the old person that is against bony union if the fragments are placed in apposition. In order to obtain apposition of fragment ends he anesthetizes the patient, flexes the thigh to lift the tendon of the psoas away from the seat of fracture and makes traction while bringing the leg down into a normal position. Fifteen to twenty pounds traction is then applied by weight and pulley. Ten to fifteen pounds pull is also applied to the upper and inner side of the thigh by weight and pulley. This side pull is the special feature that produces the good results, its action being to lift the upper end of the long fragment upward and outward, and by making the capsular ligament taut bring the short fragment into position. The fact that union has followed this treatment in a number of cases is of no small significance.

Painter [39] reports three cases of intracapsular fracture of the femoral neck. In one case the fragments were wired together with silver wire; in a second the bone ends were trimmed off and the leg put up in 25° abduction. The fragments were apposed in the third and a ten-penny wire nail driven through to secure them. Good functional results followed all these operations.

Harting[40] defines coxa vera as a static deformity due to burdening the upper end of a femur weakened by rickets, trauma, tuberculosis or osteomalacia.

Froelich[41] divides the cases into symptomatic and an essential coxa vera. In the symptomatic class there is hypertrophy of the neck, and the angle is very near the trochanter major. In the essential class the neck is not hypertrophied, and the angle is near the head. Reiner[42] is of the opinion that coxa vera is an antecedent step in the deforming process which has for its final result the congenitally defective femur. Codivilla[43] recommends osteotomy at the neck, the seat of the deformity. He does not believe in the loss of any bone, or that the operation should involve the coxo-femoral joint.

The visit of Professor Hoffa, of Berlin, to this country in the early summer of 1904 was an event of great interest and satisfaction. The character of the man is such that entertainments given in his honor were a long to be remembered pleasure to those who were fortunate enough to be present. He attended the meeting of the American Orthopedic Association at Atlantic City, and contributed much to the interest of that meeting. He operated and lectured in most of our large cities, and gave a lecture in the German educational exhibit at the Louisiana Purchase Exposition. He was accompanied by Dr. Hanz Spitzy, of Graz, Austria. In passing, a word of comment is not out of place on the fact that this visit was not marred by an unpleasant newspaper notoriety.

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ILEO-COLITIS IN CHILDREN.

By W. S. Wallace, M. D.,
OF EXCELSIOR SPRINGS, MISSOURI.

My subject is a seasonable one at this time, as during this and next month we will meet with it more frequently than with any other disease of childhood, and if we are not always on guard it will claim more victims than will any other disease during July and August.

The season of the year points us to the etiology of this disease, probably the most important factor of which is extreme heat. In statistics taken from cases in the hospitals of New York City it was found that the number of cases of ileo-colitis, together with the mortality, rose or fell in more or less direct ratio with the temperature and atmospheric conditions, and even with us, situated as we are, the debilitating effects of the heated term, together with its effect on the decomposition of food, play an important part in the causation of this disease. Improper food, unripe or over-ripe fruit, copious draughts of ice water, everything which may act to hinder digestion or impair nutrition, acts in a causative relation.

The pathology of this disease has been the subject of many learned discussions, but I am persuaded that post-mortems fail to give us an adequate idea of the intense congestion present before death. There is evidently at the beginning a swollen and congested mucous surface, which congestion increases until circulation being interfered with, necrosis and ulceration of circumscribed areas take place, which may be superficial or deep, and which usually implicate the glandular structures in the walls of the bowel, the bowel is filled with an acrid, greenish fluid, in which floats fecal matter, shreds of mucous membrane, and, may be, blood and quantities of undigested food.

The ushering in of ileo-colitis is attended by restlessness and pain, followed by vomiting and nausea, the temperature rises to 102° or 104° F., bowels become tender and tympanitic, followed soon by alvine discharges more or less profuse, at first thin and watery, later becoming scanty, very frequent and composed largely of mucus, very small amounts of fecal matter and probably blood.

The discharges are greenish color, usually all the way through the course of the disease. The quantity of blood and the height of the temperature are usually in proportion to the depth and severity of the ulcerative process. As the disease progresses the little patient shows all too plainly how severe the tax is upon its vital forces by the rapid loss of flesh and great weakness. Under careful treatment the character and frequency of the stools gradually change, the fever falls and the appetite returns, and recovery is soon complete. Otherwise the temperature remains from 101° to 102°, vomiting and frequent bloody stools continue, emaciation is progressive, the dreaded brain symptoms appear, and before long death ends the scene.

It is my custom, when called to attend such a case, at once to withdraw all food for twelve to twenty-four hours, or until I have thoroughly cleared out the alimentary tract, and then to select the smallest variety and quantity of food consistent with condition, and, if necessary, to predigest it.

Albumin water (the white of egg with water, a bit of sugar and a few drops of lemon juice).

Sterilized milk diluted with water, lime water, or carbonated Vichy.

Bovinine I consider one of the best foods, diluted with water, milk or grape juice, and especially as a rectal nutritive enema where the stomach is extremely irritable or digestion and assimilation poor, and later, during convalescence, sterilized milk or malted milk.

I want to emphasize the fact that the matter of feeding is even more important than medication, and unless it is given the strictest attention you will often meet with failures where you might succeed. Even the drinking water should be boiled, and every precaution taken to prevent further infection of the already inflamed bowel. I have spoken of thoroughly emptying the prima via, and it is of the first importance. It is my custom to give a grain of calomel in divided doses with sodi bicarbonate, to be followed shortly by frequent small doses of Abbott's saline laxative, two tablespoonfuls in a glass of water and flavored with sugar and lemon, a tablespoonful of the solution to be given every half hour till effect. This once accomplished, we can turn our attention to intestinal antiseptics, and of these we have a great number, but a few have proven so effective for me that I am partial to them—the salts of bismuth are among the first, the subnitrate or salicylate, but especially bismuth with resorcin and some of the acids of the phenol group, meet with my approval.

The sulphocarbolates of zinc, lime and soda I find effective where the stomach will retain it. Where the temperature is high, the antipyretic and antiseptic effect of salol is sometimes desirable, but the important part is to select the agent you wish to do the work, and then push it to its full effect, give it frequently until the odorless stool and lowered temperature proclaim its effect, use as little of the old symptomatic plan of treatment as possible, study your little patient carefully, make up a clinical picture of its condition, decide definitely what you want to do, then do it.

I have not referred to fever and pain, checking the discharges, etc., because I try to so conduct my cases that these symptoms will not be a factor in the case, but if they come in in spite of me, I control fever by cool sponging, and if pain or excessive peristalsis is present, it calls for a very minute dose of opium for the time-being, but, properly handled, there is small need for this.

REPORT OF A CASE.

Baby B., sixteen months old (a girl), ordinarily well nourished, surroundings very poor and unhygienic, ten hours after eating three half-ripe apples, attacked by severe chill with vomiting and pain. I did not see her until four days after the attack; temperature was then 103½°; pulse 120; respiration 30; bowel tender and distended with gas; free alvine discharges of thin, greenish, blood-streaked material, with much mucus; odor very offensive. There was great thirst, but water would at once produce vomiting. I gave at once calolactose, two grains dry on the tongue, repeated at one-half hour intervals till six doses were given; resorbisnol, six grain powder every two hours; ordered cool sponging until fever was reduced, and withdrew all food of whatever character. Called the next morning, twelve hours later, to find fever 100°; pulse 110; discharges less free, but quite frequent, and showing some evidence of biliary secretion, but blood-streaked; vomiting had stopped. I ordered the saline solution referred to above, on chocolate-coated tablet every two hours, and there being some tenesmus, I gave five drops tincture opii camph., to be repeated in one hour till effect. At four p.m. her temperature was still 100, bowels very tender, but less tympanitic. Ordered the white of an egg in water every four hours, a small amount; stopped the saline solution and continued intestinal antiseptic, one tablet every three hours. This plan of treatment was kept up, and on the fourth day of treatment there was added high colonic flushings and Bovinine given diluted, alternately with white of egg, with the flushings continued. The fifth day of treatment showed a normal temperature, and under careful feeding and regulation of bowels when needed with the old neutralizing cordial, this little patient went on to complete recovery by the end of the second week.

This, though brief, will, I hope, serve to give an idea of my plan of treatment of ileo-colitis, which has furnished me most most happy results.

SOCIETY PROCEEDINGS

PHILADELPHIA PEDIATRIC SOCIETY.

December 13, 1904.

The President, DR. JOHN H. JOPSON, in the Chair.

INCONTINENCE OF FECES IN CHILDREN.—This subject was discussed in a paper by Dr. M. Ostheimer. He said that whereas enuresis was common in children, incontinence of both feces and urine is unusual, and incontinence of feces alone is very rare. In certain cases some cause, either general or local, can be found for the condition; in another class the general nervous condition of the patient is responsible. Sometimes the incontinence is observed from infancy, and in other cases it appears suddenly after the third year in children apparently healthy. The author described twelve cases from literature which illustrated the classification he had made, and added four which had come under his own observation. Treatment by fresh air, nourishing food, strychnin and various tonics was successful, although the condition might recur in case the patient became run down for any cause.

HEMORRHAGE OF SYPHILITIC ORIGIN IN THE NEW-BORN.—This subject was treated by Dr. W. R. Wilson, who called attention to the fact that hemorrhages in the new-born, although frequently due to other causes, often accompanied the more generally recognized evidences of syphilis. The form of syphilis in which this symptom appears does not necessarily exhibit any cachexia, and is referable, consequently, to a constitutional tendency. It is likely that the syphilis is not directly responsible for the hemorrhages, but that they are due to degenerative changes in the blood and vessels, resulting from the syphilitic condition.

About one and one-third per cent. of the children born at the Lying-in Charity Hospital in Philadelphia between 1901 and 1904 suffered from hemorrhage, and the greater number of such infants died. In about 22 per cent. of them a history of syphilis was found in the parents, or else syphilis was proved in the infant.

Dr. Wilson explained the various forms under which the hemorrhage might appear, and discussed the question of its immediate cause. He thought that the pathological condition of the vessels in syphilis was not sufficient to account for the hemorrhagic tendency, since the extravasation is most commonly observed in the form of capillary oozing. More probably it is due to a disturbance of the relation between the character of the blood and the containing capillaries. The fact that bleeding from the cord persists in spite of ligation shows that the coagulability is reduced, and the efficacy in such cases of drugs, calcium chlorid, for instance, calculated to increase coagulability is another bit of evidence in the same direction.

Syphilis in which these hemorrhages occur usually fails to show the characteristic symptoms, and when any such are present they are more often the congenital manifestations than the hereditary ones. In the hemorrhagic cases the infection would seem to have been generally remote. Icterus is present in some degree in nearly every case of hemorrhage.

Dr. Wilson reported seven cases, all fatal, and three of stillbirth, which illustrated his conclusions.

Prompt treatment is demanded by evidence of internal hemorrhage in syphilitic children. Rest is of primary importance, and the infant should be kept in the incubator and disturbed as little as possible. Inunctions of mercury may be used, but in case of extensive skin hemorrhages without rubbing. Oil baths may alternate with these. In fever or intracranial hemorrhage the ice cap is useful. In case of severe melena, nourishment should be given in small quantities, frequently repeated, with a view not to encourage perstalsis. For internal use the following drugs are employed: suprarenal extract, half grain doses repeated; Adrenalin solution, 1-1000 one drop repeated; Gelatin water, two drams to one pint; Fluid extract of ergot, dose one drop.

Dr. Jopson spoke with strong approval of Dr. Wilson's clear statement of the classification of the various forms of hemorrhage of the newborn.

Duration of the Prodromal Period in Rötheln.—This question was discussed by Dr. D. J. M. Miller, who opened his paper with a summary of the literature upon this point. The accumulated testimony seems to be that the prodromal period in rötheln is commonly very brief, not over 24 hours, or lacking entirely, and that only in rare instances does it extend over a period of 2, 3, 4, or even 6 or 7 days. Dr. Miller, however, believes that this longer type occurs much more frequently than indicated, owing to the fact that physicians are not called in until the eruption appears, and the preliminary symptoms escape the notice of mothers and nurses. In the only instances, three in number, where he had been in a position to determine accurately the duration of the prodromal period it had been prolonged until the fourth, and in one case to the sixth, day. This last case exhibited a distinct remission during the second, third and fourth days. The occurrence of this remission, mentioned also by Emminghaus, may partially account for the prevalent ideas as to a brief prodromal period, the exacerbation being easily mistaken for the onset.

Dr. Westcott had also noticed a distinct febrile prodromal period in rötheln, and regarded as of considerable importance in distinguishing the disease from mild scarlet fever. He himself had seldom seen the so-called scarletiniform type, but scarlet fever of a mild type was so often encountered that whenever a rash was at all suspicious in character that diagnosis should be made provisionally.

Dr. Miller said that he had also never seen the scarletiniform eruption in rötheln. It more often resembled measles.

CHICAGO PEDIATRIC SOCIETY.

January 17, 1905.

The President, DR. SAMUEL J. WALKER, in the Chair.

HYPERTROPHY OF THE FAUCIAL AND PHARYNGEAL TONSILS IN CHILDREN: IMPORTANCE AND NECESSITY FOR EARLY DIAGNOSIS AND TREATMENT.—Dr. T. Melville Hardie read this paper by invitation.

The author stated that one of the troublesome features of the case is the fact that so much has been said about adenoids in the past thirty-five years that it is really difficult for the average practitioner of laryngology and otology to believe that mankind could possibly have existed comfortably with such a deforming, ear-destroying, disease-bringing body of lymphoid tissue in his centuries old naso-pharynx. In the matter of the faucial tonsils we have been better treated, for Celsus (A. D., 10) speaks of tonsil incision with the familiar manner of one who considers it an ordinary operation, and Paul of Egina, A.D., 750, directs that the head of the patient be held, his tongue pressed down with a spatula by assistants, while the tonsil, being seized and drawn outward by a tenaculum, is cut out by the root. During the succeeding centuries it is true the operation was not always popular. Dionis, 1672, absolutely opposed removal of the tonsils because of the physiological importance of the glands; and Heister, 1683, observed that "this operation is not only too severe and cruel, but also too difficult in its performance to come into the practice of moderns, because of the obscure situation of the tonsils." From Morell Mackenzie's historical sketch, however, we learn that we have been more vigorously operated upon for the past one hundred and fifty years, nor is it at all likely that the faucial, any more than that other lamented segment of Waldeyer's ring, will suffer future neglect until that day arrives when mind can so prevail over matter that we can not be harmed by such constant handicaps as mouth-breathing, for example, or by the occasional, but all too frequent, attacks of the Klebs-Loeffler bacillus.

1. What, then, are the functions of the tonsils that they should be preserved?

2. What harm are they responsible for and how is it produced?

3. What benefits and what harm may follow their removal?

(a) It is to be remembered that the tonsils are distinct, localized collections of lymphoid tissue, into which the epithelium is invaginated and which contains numbers of round or avoid bodies called the follicles of the tonsils. These follicles are constantly manufacturing leucocytes which pass into the efferent lymph vessels or out into the crypts formed by the invaginations of the epithelium. This has been proven and it is assumed by some and denied by others that these leucocytes by virtue of their phacocytic action protect the organism from infection. Hodenpyl, after elaborate experiments, concluded that the normal tonsil absorbs neither fluid nor solid matter, and that it cannot be penetrated by bacteria. It has been proved, however, by Goodale, bv means of carmine injected into the tonsillar crypts, that absorption of fluids and finely divided solid particles does take place. This was also independently shown by Hendelsohn, who used dyes, which were blown on the surface of the tonsil. All other suggested functions, such as the furnishing of a lubricant for the food bolus, are not merely theoretical, but improbably because the normal tonsil is so small that its function must be of no more importance than that of a small lymph gland.

(b) For what harm are the tonsils responsible, and how is it produced? If we believe with Mayo Collier that respiration is the supreme function of the economy, we must perforce conclude that any considerable interference with this function is decidedly injurious. Physiologists have proven that the circulation and oxygenation of the blood, not only in the systemic, but in the portal system as well, is dependent on respiration. Enlarged tonsils and adenoids act mechanically as an obstruction to free respiration, and mouth-breathing, which results, produces effects on the mucous membrane of the respiratory tract that are prodigious. The inspired air passes normally upward to the level of the middle turbinated body, thence backward to the vault of the pharynx, whence it is deflected downward, and the function of the nose is to warm, saturate with moisture and cleanse the inspired air, and the irritation which results from the breathing of unmoistened and unfiltered air gives rise, directly or indirectlv, to one or all of the following: Pharyngitis, laryngitis, and consequent laryngeal spasm, tracheitis, bronchitis and pneumonia. Mouth-breathing increases the vacuous pressure on the walls of the respiratory tract, and hence is responsible in some degree for the partial collapse of the chest wall, "chicken-breast", so frequently seen in rachitic children who suffer from enlargement of the pharyngeal tonsil. It is, furthermore, believed bv man that narrowing of the alveolar arch of the upper jaw is a consequence of mouth-breathing. As to the manner in which is accomplished there has been much discussion.

In considering the various causes which produce the abnormality of the palate, Swain would lay most stress upon the lack of proper secretion of the maxillary sinuses, as retarding their development, and hence that of the whole superior maxilla. The author quoted the opinion of various writers as to the causes of this abnormality of the palate.

And now, what can be said about the ears? Adenoid vegetations and the faucial tonsils are a constant menace to the hearing, and it has come to be a feeling on the part of most of us whose work largely concerns the ear and throat, that the practitioner who uses carbolic acid and glycerine and the hot water bag without insisting upon the after removal of the tonsils and adenoids, which are the usual cause of the ear-ache, is guilty of malpractice. The growth may mechanically obstruct the Eustachian opening, although fortunately for children it is placed lower down on the lateral wall of the pharynx than is the case in the adult. The venous congestion present in the vault of the pharynx causes a secondary congestion in both the middle ear and labyrinth. The closure of the Eustachian tube interferes with the ventilation of the middle ear, and as a consequence the external atmospheric pressure forces the drumhead inward.

A great deal has been written in recent years upon the infections which may enter the organism through the tonsils. The faucial tonsils have, by reason of their situation, received the most study, and, having granted the contentions of Goodale and Lexer, we must conclude that these glands when hypertrophied not only play an important part in the matter of infection, but seriously complicate the course of manv of these infections. Goodale examined a number of tonsils affected for various periods by an acute infection, and concluded that the micro-organisms multiplying in the crypts may produce toxins which, being absorbed, give rise to an acute proliferative tonsillitis, or by passing through the epithelium cause abscesses in the follicles themselves, or may be carried by the efferent lymph vessels to the neighboring lymph glands, producing an adenitis. Lexer's experiments prove that while certain streptococci were not absorbed by the tonsil, others were very virulent, causing death either in two days or by a slower general infection, as manifested by the suppuration of fractures and development of lymphatic abscesses.

Mayer and Ullman have contributed two comprehensive papers on the tonsils as portals of infection and Ullman concludes:

"1. That the normal tonsil has a physiological function, probably protective.

"2. That being in itself often diseased, the physiological function of the tonsil is impaired, and that instead of being protective, it is the nidus for the growth and distribution of pathogenic organisms and their poisonous products into the system.

"3. That many grave and fatal general infections have their origin in the tonsils.

"4. That if the exanthemata, especially scarlatina, are of bacterial origin, the tonsil acts in part as a port of entry.

"5. That acute articular rheumatism and the diseases often associated with it, endocarditis and chorea, in a great majority of cases are due to the action of attenuated bacteria, their toxins or both toxins and bacteria entering the general system through a diseased tonsil."

Tuberculosis is, perhaps, the most frequent chronic infection which enter the system by way of the tonsillar tissue in the throat and naso-pharnyx. The author cited several authorities to establish this point.

After mentioning a few of the other complications of tonsillar hypertrophy, the author concluded his interesting paper in the following words: "I had intended to discuss the benefits which follow the removal of tonsils, but will content myself with the assertion that there is improvement in almost every particular and in almost every patient. Deaf-mutism is not cured by the removal of adenoid vegetations, but almost everything else attributable to the affection is. But the greatest reason for operation is the prophylactic.

"What harm may follow the removal of the tonsils? The consideration of this question is, perhaps, apart from the general purpose of this paper. The only possibility of evil comes from the anæsthetic and from hemorrhage, and I have taken the liberty of mentioning the matter to protest against the use of chloroform in operations for the removal of tonsils and adenoids. We may have our doubts as to some of the other anæsthetics, but it has been shown by Halsted, Hinkel, and others that the lympathic diathesis especially favors the depressing effect of chloroform upon the heart, and its use should not be considered when there exist other anæsthetics relatively safe. Several cases of fatal bleeding after the removal of adenoids and tonsils have been reported, and some others have occurred which have not been published. In my opinion, no one should remove these growths unless certain that his patient is not a subject of hemophilia. For the others we must be prepared."

Dr. George E. Shambaugh read a paper entitled—

EARLY COMPLICATIONS IN ACUTE INFECTIONS COMMON TO INFANTS AND YOUNG CHILDREN; FREQUENCY, EARLY DIAGNOSIS AND TREATMENT.—The great frequency of ear disease in early childhood is due in part to the anatomical condition which allows infection from the naso pharynx to reach the cavum tympani more readily at this age than in the adult, but more to the fact that in childhood occur with great frequency certain acute infectious fevers which, occurring at any age of life, are very prone to produce middle ear disease.

The middle ear disease results often from infection extending along the tuba auditiva to the cavum tympani, but there are reasons for doubting whether this is the only method of extension or even the more common one.

The otitis media complicating the infectious fevers in early childhood is occasionally the result of invasion of the cavum tympani by the specific germ causing the general infection, but it frequently happens that the otitis media is caused by other pus producing micro-organisms, particularly the streptococcus, staphlococcus and the pneumococcus.

Purulent otitis medio following the acute infections of childhood is a condition much more to be feared often than the original general infection. Every physician should be thoroughly awake to the seriousness of this disease and alert to detect its existence in its earliest stages, for much of the dangerous character of the condition can often be averted by proper treatment applied when the disease first manifests itself. In scarlet fever, as well as in measles, there often occurs the most rapid and extensive destruction of soft parts and bones of the ear showing little tendency to heal, producing marked permanent disturbance of hearing and having a high rate of mortality.

The diagnosis is made by inspection of the membrana tympani. This is often rendered difficult from the narrowness of the canal, and the presence of a plug of desquamated epithelium which frequently forms in the bottom of the canal.

In scarlet fever it frequently happens that acute necrosis of the temperal bone occurs with no complaint except headache, with no pronounced signs over the mastoid, and even in the absence of disease in the cavum tympani.

The symptoms which should lead one to suspect an otitis media in young children are extreme restlessness, sudden high temperature, the occurrence of symptoms of meningitis.

Otitis media in childhood often takes a very protracted course running through many weeks without causing rupture of the drum, yet producing at irregular intervals rise and fall of temperature until finally the rupture occurs.

EDITORIAL

EPIDEMIC CEREBRO-SPINAL MENINGITIS.

That the question of cerebro-spinal meningitis is rapidly assuming formidable proportions is a truth not to be masked. The epidemic of 1904 claimed 1,010 victims in New York City, and every practitioner should feel it his duty to equip himself to the best of his ability in order to be as ready as possible to meet this dread disease.

The importance of this matter has been recognized by the foremost specialists of the profession, and a symposium of the recognized authorities at the annual meeting of the Medical Society of the State of New York in Albany, January 31, 1905, offers the best practical and theoretical knowledge available on the subject. This symposium is discussed in the *Albany Medical Annals* for March, and should be consulted by every physician who appreciates the menace of this disorder.

The pathology and bacteriology are discussed by Dr. William T. Councilman of Boston, who points out that the three organisms usually concerned in the infection are the *Diplococcus intracellularis meningitidis,* the *Pneumococcus* and the *Streptococcus.* The first of these is responsible for the epidemic type of the disease, and sporadic cases are more frequent than is generally recognized. The prognosis is much more hopeful in this infection than in that of the pneumococcus or streptococcus. The organism may be found in the nose, associated with acute rhinitis, and it is probable that infection of the meninges takes place by extension from some of the adjacent mucous membranes by means of the lymphatics. Dr. Councilman believes that the frequency of pneumococcus meningitis is over-estimated. Streptococcus meningitis has a greater tendency to extend along the cerebral nerves than have the other forms; and both it and that due to the pneumococcus show, accompanying the inflammation, an acute proliferative inflammation of the veins and arteries, a lesion that has not been found in meningitis due to the *Diplococcus meningitidis.*

The symptoms and diagnosis falls to the share of Dr. Henry

L. Elsner of Syracuse, who treats it clearly and carefully, giving particular attention to the questions of the Kernig phenomenon and of lumbar puncture, and although the limits of his paper prevent an adequate discussion of the differential diagnosis of conditions resembling cerebro-spinal meningitis, what he says on that topic cannot fail to be helpfully suggestive.

The treatment of the disease is taken up by Dr. Charles G. Stockton of Buffalo, who reaches the conclusion that among the various measures advised the following give best promise of benefit: first, absolute quiet in well-ventilated, darkened rooms; second, great attention to the proper performance of all the functions of the body; third, hot baths after the method of Aufrecht; fourth, intraspinal puncture with drainage where necessary to relieve severe pressure symptoms; fifth, antipyrin for reduction of temperature and the relief of headache and hyperesthesia; sixth, opium or the bromides, alone or in connection with antipyrin, for relief of convulsions and pressure symptoms generally; seventh, mercury when needed for laxative effect or to stimulate the organs of elimination.

Dr. Stockton emphasizes the fact that "the sanitarian is more useful than the therapeutist" in combating this disease, and warns against the dangers of overcrowding and poor ventilation.

The eye symptoms in cerebro-spinal meningitis was the subject assigned to Dr. A. E. Davis of New York, and although the great variation in these symptoms in different epidemics makes the estimating of them difficult, Dr. Davis thinks they may be of much importance in clearing up a diagnosis. Inequality of the pupils, especially if accompanied by squint, should place the practitioner on his guard, and many of the motor symptoms can be observed without the use of the ophthalmoscope and should always be looked for, such as paralysis of the different muscles, pupillary changes, ptosis, etc. The mortality is noticeably higher in cases where eye lesions are present, especially if the fundus be affected.

Following the reading of the papers, a vigorous discussion adds much to the value of this symposium, which no physician can afford to miss.

EXPERIMENTAL MEASLES.

The literature on the subject of experimental measles dates back to the experiments of Francis Home of Edinburgh, in 1758. Home proceeded on the assumption that the cough and lung trouble, frequently such a distressing feature of the disease, was due to receiving the infection mostly through the lungs, and hoped, by communicating the infection by the skin alone, to render the disease less troublesome and dangerous. Various difficulties stood in his way. The limited technic of the day did not offer any adequate method of obtaining the virus unmixed with common microbes. All inoculations must be performed on human beings, as the disease is, so far as known, not communicable to animals. Nevertheless he went to work, and left us an elaborate report of statistics regarding the fifteen cases inoculated by him. His naive satisfaction in the very inconclusive results cannot be shared by us to-day, but seems to have been accepted by his contemporaries and those of following generations, with the exception of the Dutch physicians, Thuessink and Themmen. Themmen secured uniformly negative results from experiments similar to those of Home, and, not content with discrediting the Scotchman's conclusions, vehemently asserted that the alleged inoculations had never been made. We have little reason, however, to believe this latter accusation, and may accept Home's report of the facts, however much we may dissent from his interpretation of them. His method was to take blood from a cutaneous vein amongst the measles at what he considered the period of "highest acrimony," and after saturating with this blood a bit of cotton, the cotton was placed in an incision in the arm of the person to be inoculated and allowed to remain there three days. Home believed that in every case he produced measles of a more mild and manageable sort than those by natural infection, but there is little doubt that all his fifteen cases had contracted the disease previous to his inoculation.

Dr. J. Cook in 1767 advocated the inoculation for measles, but mentioned "the watery humor that stands in the eyes" of patients ill with measles as the proper vehicle of infection. Various other writers recommended skin, tears, nasal discharge and saliva.

From time to time other experiments were conducted, with various degrees of "success," but all, to modern minds, were valueless, owing to the failure to eliminate other possible factors than those intentionally introduced, and almost invariably where measles followed the inoculation the length of time intervening before their appearance and the existence of other cases in the vicinity suggested irresistibly the probability that the disease wwas contracted naturally, either previous to or subsequent to the inoculation.

During the epidemic of measles in Vienna in 1845-57, F. Mayr made some observations on the subject which were more acute than those of his predecessors. He inoculated with material obtained by scratching the center of a rubeolous spot, and measles appeared duly. Fresh nasal mucus placed upon the membrane of the nose succeeded in two out of three cases. But Mayr points out the fact that no diminution in the gravity of the disease was secured, and dismisses the process as of no practical importance.

Of late, however, some interesting experiments have been undertaken by Ludvig Hektoen of the Memorial Institute for Infectious Diseases in Chicago, for the purpose of determining "whether or not in measles at the height of the attack the blood contains the cause of the disease." These experiments are reported in the *Journal of Infectious Diseases* for March, 1905.

Blood was taken from a boy of nine on the fourth day of a mild, but typical, attack of measles, at the time when the typical rash appeared. The skin of the right elbow was scrubbed with soap and water and then alcohol, after which 4 c.c. of blood were withdrawn. With this, blood cultures were made upon ascites broth, as described in detail in the article cited, and finally a healthy young man submitted himself to inoculation. In this case precautions had prevented the possibility of natural infection. Thirteen days after the injection the patient's temperature began to rise somewhat, and two days later the eruption appeared. No respiratory symptoms appeared at any time and he made an uneventful recovery, his appetite remaining unimpaired throughout the course of the disease.

In the second case the blood was taken from an Irish girl

21 years old, and the injection made in the back of a young man of 28 years. This time the rise in temperature was detected on the evening of the eleventh day, followed by slight conjunctivitis, some cough, mucus in throat, and redness of tonsils. The typical eruption appeared at the usual time. The patient was not seriously ill, and recovery was prompt.

Dr. Hecktoen's conclusions may be quoted:

"The virus of measles is present in the blood of the patients some time at least during the first thirty hours of the eruption; furthermore, the virus retains its virulence for at least twenty-four hours when such blood is inoculated into ascites broth and kept at 37° C. It is not difficult to obtain the virus of measles unmixed with other microbes, and in such form that it may be studied by various methods."

ABSTRACTS

Spontaneous Rupture of the Heart in Infants.—William Harvey was the first to observe a case of rupture of the heart, and at no time has a case been seen in a child less than one year old until recently, when a case came under the observation of L. Schaps (Arch. f. Kinderheilk., Vol. 40, Nos. 1 and 2). The most prominent cause of cardiac rupture is arteriosclerosis, but in this case it was a septic embolus that lodged in the heart muscle. This case is of considerable interest, as it furnishes a new cause to that long list of causes of sudden death in infants. A child of four months was brought to the hospital, badly nourished and presenting small, discrete, subcutaneous abscesses in the back, head and extremities; there was a maculopapular exanthem, the bridge of the nose was depressed, the child had snuffles and excoriations about the nose. The spleen and liver were enlarged, and there were small papules about the arms. A swelling of the lower end of the left forearm proved on radioscopy to be a swelling of the epiphysis of the radius. The case was clearly one of congenital syphilis, and was given inunctions of one-half gram of ung. cin. pro die, and was nourished by means of expressed woman's milk. Four days later there occurred a sudden rise of temperature. The next day a few fine râles were heard over the pericardium, and in the afternoon, one-half hour after feeding, the child died suddenly. At autopsy the pericardium was found filled with thin blood and dark necrotic fragments. There was a fibrinous exudate over the pericardium. In the middle of the left ventricle there was a perforation 3 mm. in diameter, in the neighborhood of which the heart muscle was soft and friable. Here was an abscess ½ cm. long in the wall of the left ventricle, sharply circumscribed, dark red in the periphery and yellow in the center. There was also a small abscess near the apex of the heart. Microscopical examination showed that the muscle in the neighborhood of the rent was quite necrotic and the nuclei did not take up the stain. Staphylococci were found. The case was one of staphylococcus sepsis (independent of lues), originating in the subcutaneous abscesses. The frequent occurrence of septic processes in infants originating like the above must be borne in mind.

The Passage of Bromide into Woman's Milk.—If bromide be given to the mother in customary doses it passes into the milk, but only in traces, according to H. Rosenhaupt (Arch. f. Kinderheilk., Vol. 40, Nos. 1 and 2). It can thus have no therapeutic value if administered by this route. Yet the possibility that pathological processes in infants may come from the administration of bromide to the mother is suggested by the case of acne in an infant immediately disappearing upon the mother ceasing to take bromide.

History of Pediatrics.—This subject, together with its relation to other sciences, was ably presented at the recent Congress in St. Louis by A. Jacobi (Am. Med., Nov. 5, 1904), and the conclusions at the end of the address are well worthy of note. He states that "pedology is the science of the young. The young are the future makers and owners of the world. Their physical, intellectual and moral condition will decide whether the globe will be more Cossack or Republican, more criminal or more righteous. For their education and training and capabilities the physician, mainly the pediatrist, as the representative of medical science and art, should become responsible. Medicine is concerned with the new individual before he is born, while he is being born and after. Heredity and the health of the pregnant mother are the physician's concern. The regulation of labor laws, factory legislation, and the prohibition of marriages of epileptics, syphilitics and criminals are some of his preventive measures to secure a promising progeny. To him belongs the watchful care of the production and distribution of foods. He has to guard the school period from sanitary and educational points of view, for heart and muscle and brain are of equal value. . . . And in the near future the pediatrist is to set in and control school boards, the health department and the legislature."

The Lymphoid Affections of the Upper Air Tract of Children.—W. F. Chappell (Med. Record, Nov. 12, 1904) describes the anatomy, functions and diseases of the pharyngeal and faucial tonsils. Adenoids may be hard or soft, and often decrease in size between two examinations, owing to change in the patient's systemic condition. The relative degree of development or dimensions of the nasopharynx is an important factor in determining the danger line of the pharyngeal tonsil, as is also the temperament of the child. An acute pharyngeal tonsilitis of a catarrhal nature is quite common in small children, without any other part of the lymphoid ring being affected. It is usually the result of a cold, and attacks the vertical clefts of the gland. The chief symptoms are high fever, the temperature rising to 105° F., extreme prostration, and some enlargement and tenderness of the posterior cervical glands. He believes that an affection of the pharyngeal tonsil causes more systemic disturbance than similar affections of any other lymphoid tissue. Conditions requiring differential diagnosis from adenoids are: (1) Lymphatism, (2) syphilitic (4) digestive disturbances, (5) congenitally high-arched palate, and gonorrheal rhinitis, (3) congenital occlusion of the nares, (6) small or occluded nostril, (7) unusually small postnasal space, (8) anterior projection of the bodies of the cervical vertebræ, (9) some malformations of the soft palate, and (10) hypertrophy of the tongue. In deciding whether the faucial tonsils are sufficiently enlarged to require removal, care is needed not to overlook so-called buried tonsils which lie hidden between the lateral pharyngeal wall behind and the opercular fold in front, and extend high up into the lateral pharyngeal vault. This is sometimes a more dangerous condition than the marked hypertrophy of the gland which occupies a large part of the pharyngeal space. If small, adenoids and tonsils not causing symptoms may be tretaed by non-operative means: but large tonsils and lymphoid masses in the nasopharynx should be removed, even if they do not produce symptoms. The author prefers to operate at an early hour of the morning, and usually under general anesthesia. Gas and ether is the anesthetic of choice for children over three years old: for younger patients, chloroform may be used to start with, followed by ether. Chloroform alone is considered very unsafe.

PEDIATRICS

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ORIGINAL ARTICLES

THE DIAGNOSIS OF PNEUMONIA IN CHILDREN

By W. M. MacDonald, M.D.,
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The object of this paper is to call attention to the necessity for great watchfulness during the course of the zymotic diseases of childhood, in order to detect at the earliest possible moment evidences of broncho-pneumonia; and also to point out some of the difficulties occasionally experienced in determining the diagnosis of lobar pneumonia in children.

It will not be necessary to review the classical symptoms of either disease. Broncho-pneumonia, while frequently occurring as a primary disease, is usually secondary to bronchitis and diseases in which bronchitis is a symptom, as whooping cough, measles, influenza, and other acute infections. The symptoms indicating the invasion are usually not marked, being those of an ordinary bronchitis. The child is apt to be less than three years of age. In a young child convalescent from or during any of these diseases, the appearance of any symptom, no matter how slight, fever, increased respiratory movement and pulse rate, indicating a retrograde movement, requires a most painstaking physical examination, although it must be admitted that, even when the disease is well developed, the physical signs are not always characteristic.

The difficulty in making a satisfactory examination of children is often very great. It is well, therefore, to make it a rule in all cases to have the patient stripped, and an effort made by the nurse to distract its attention until the chest is completely gone over. In some cases it is easy to entirely overlook sounds that are distinctly characteristic, if every part of the chest is not noted.

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*Read at the Central Wisconsin Medical Society, Beloit, April 26, 1904.

At the rear and lower portion of the chest are most apt to be found the characteristic subcrepitant râles.

Pepper observed that "the sounds of broncho-pneumonia are in no sense characteristic; but when to the râles of bronchitis there are superadded fine subcrepitant râles, with harsh or blowing breathing, and areas of even indistinct impairment of resonance at the postero-inferior portions of the lungs, the evidence, so far as physical examination is concerned, is fairly clear." Percussion will occasionally show points of dullness, and often it will not.

Antedating the appearance of fever and increased respiration, for a few days, there may have been constipation and green stools, calling attention to the digestive tract rather than to the respiratory.

If a cough were always present with the accession of fever, little difficulty in diagnosis would be experienced; but it not infrequently happens that little or no cough is present at the beginning of these cases.

There is one early symptom quite constantly present in acute pulmonary affections which is immediately suggestive, that is an increase in the frequency of respiration. With this will usually be found some fever. We have all observed cases in which no symptoms were present for several days, beyond increased respiration and a little fever, which then developed the characteristic symptoms. This is due to the bronchitis so often preceding the actual development. We have also seen young children convalescent from whooping-cough suddenly develop a very high temperature, increased respiration, and green bowel movements, with absolutely no cough or characteristic chest sounds for several days. The occasional absence of cough is very misleading, but the increased respiratory movement is very significant.

There is a form of broncho-pneumonia occurring in new-born infants, which, from its insidious onset and rapidly fatal termination, is apt to leave the physician in doubt as to what ailed his patient. The child may have manifested evidences of a slight cold, when suddenly it is seized with convulsions which may be frequently repeated, accompanied by diarrhea and enteritis. This may occur without much fever or cough; but, as a rule, the respirations are decidedly increased, and it is unusual that a trifle of cyanosis is not present.

It is well to observe, in passing, that cases of broncho-pneumonia making an unusually slow convalescence may have tuberculosis as a primary cause, affecting the bronchi or lungs, since intercurrent attacks of broncho-pneumonia are not infrequent in pulmonary tuberculosis of children.

The evening temperature of broncho-pneumonia is usually higher than the morning temperature. I recall a case, occurring a few years ago, in which there appeared considerable excitement and intestinal disturbance, with this evening elevations of temperature, which confused a noted diagnostician for five days, owing to the absence of characteristic lung sounds; the case presenting an excellent counterfeit of typhoid fever.

To-day the early signs of pneumonia rarely need be confused with typhoid, even in the absence of distinctly objective symptoms, when it is remembered that a blood count in either form of pneumonia almost always shows a decided leucocytosis, while in typhoid there is rarely an increase; in fact, there may be a diminution in the number of leucocytes early in the disease, and usually before a Widal reaction could be looked for.

Both primary broncho-pneumonia and the lobar form may, owing to their sudden development, be confused with other diseases in much the same way; and they are much more apt to be confused with diseases entirely remote from the lungs than secondary broncho-pneumonia.

Fortunately, lobarpneumonia in young children is not nearly so fatal as broncho-pneumonia. Children attacked with this disease are usually, though by no means always, over three years of age, previously vigorous and robust in health. Some writers assure us that lobar pneumonia is almost as common in infancy as it is after the third year. In my own work I have seen very few cases of lobar pneumonia in young children.

So many cases of lobar pneumonia in children are inaugurated with pronounced pain that our attention is entirely absorbed by the distress remote from the seat of disease. Pneumonia beginning with severe abdominal pain, either localized or general, high fever, constipation, vomiting, rapid breathing, and anxious facial expression, might very easily pass for a case of appendicitis, until the development of pulmonary sounds indicates the disease in hand. These indications, unfortunately, are often late in appearing.

The importance of an early diagnosis between appendicitis and pneumonia is obvious. Let the physician invariably interrogate the lungs at every point and allow no surgical interference in these cases until he has demonstrated the lungs to be sound. Pain in the side, cough, or an expiratory grunt, no matter how infrequent, is suggestive. A leucocyte count in these cases is not helpful, since it is usually high in both diseases. In adults, pneumonia in the upper lobe is rare; but in children it is of very frequent occurrence. In these cases resembling appendicitis, however, the disease is most apt to be found at the base, rather than at the apex, on the right side. The fever in pneumonia will usually be found much higher than in appendicitis, and it is apt to remain steadily high until defervescence. Respiration is rather more rapid in pneumonia, and close inspection often discerns a slightly restricted movement on the affected side. The abdomen may be tympanitic, tender on the right side, in pneumonia, and even the right rectus muscle rigid, but it has been observed by Barnard that the gentle but firm pressure of the flat hand will detect a light relaxation of the abdominal walls between each respiration in the case of pneumonia, which is not the case in appendicitis.

The crepitant râle is most surely heard during deep inspiratory efforts and coughing, and only after the most diligent and frequent search should it be considered absent. Too much importance, however, should not be placed upon its absence, as it is often not heard in children; neither is the dullness on percussion so pronounced as in adults.

If convulsions occur at the beginning, it is pretty good evidence that the case is not appendicitis. The finding of the pneumococcus of Fraenkel would point strongly toward pneumonia; but unfortunately sputum is rarely obtainable from children.

Cerebral symptoms may so predominate in a case of pneumonia at the beginning that some difficulty may be experienced in eliminating meningitis. Convulsions, vomiting, headache, general hyperesthesia, and high fever may be present in either, and some time may elapse before there are characteristic developments.

The usual respiration-pulse ratio of 1 to 4 is more apt to be maintained in meningitis than in pneumonia, where it often reaches 1 to 2. Respiration is not usually so rapid in meningitis, nor will there be present that appearance of breathlessness, expansion of the alae and the dark red flush in one cheek. In meningitis the tache cerebralis is nearly always present; strabismus; rigidity of the neck, and Kernig's symptom are quite commonly present, and it is not likely that a cough will be present. Some assistance may be derived from an estimation of the chlorides in the urine, since in no other acute disease will the chlorides be found so low as in pneumonia.

Other diseases may somewhat closely simulate pneumonia, but probably none so important as those mentioned.

If the physician is not in constant attendance upon children with the infectious diseases of childhood, he should warn those in attendance to be alert and observant of any symptom, no matter how slight, and to report to him at once, so that the invasion of broncho-pneumonia may be met promptly. And, further, before making a diagnosis of appendicitis or meningitis, the physician should give the chest and head the very best examinations of which he is capable.

THE UNCERTAINTIES OF EARLY DIAGNOSIS AND THE NECESSITY OF EARLY AND VIGOROUS TREATMENT OF DIPHTHERIA.*

By T. F. McMahon, M.D.,
OF ONTARIO.

The death rate from diphtheria in Ontario, as elsewhere, is altogether too high. In 1902, 2696 cases were reported, with a mortality of 15 per cent. In Toronto, 893 cases were reported with 115 deaths—a mortality of 13 per cent. Hamilton had 22 per cent. of deaths, Brantford 16 per cent., and Ottawa 12 per cent.

In Ontario the people are as a rule well fed and well housed, and the results ought to be much better than in the crowded, poverty-stricken centers of the older countries. In the pre-antitoxin days our percentage of mortality was much lower than in New York and the large cities of Europe, where the mortality averaged from 30 to 40 per cent. If their percentage mortality has been lowered from the above rate to 16 per cent. or less, surely ours in Ottawa ought to show a corresponding decrease. But the report of the Ontario Board of Health shows that in 1902 it was 15 per cent.

I have questioned a large number of practitioners who use antitoxin faithfully and intelligently and they tell me that they now rarely lose a case of diphtheria, whereas in the pre-antitoxin days a very large percentage of their cases succumbed.

I am not going to enter into any argument to prove the efficiency of antitoxin. I take it that you will agree with me that nearly every intelligent practitioner is as firmly convinced of the efficacy of antitoxin in diphtheria as that of quinine in malaria or mercury in syphilis. I shall assume then that we are all believers. The object of my paper is to point out that many lives are lost that ought to be saved, and that as a result of faulty or tardy diagnosis and late and half-hearted treatment the death rate is double or treble what it ought to be. Let us examine our consciences and find wherein we have been remiss.

For many deaths we are not responsible. Those in charge of sick children often do not call in the physician until fatal poisoning has occurred. But there remain a large number of cases in which the physician is called and yet the undertaker follows in his wake. Let us examine the causes of his failure.

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* Read at meeting of Ontario Medical Association, 1904.

1. His attention is not specially directed to the throat and he fails to look at it, and diagnoses something else. By the time he recognizes his error the case is hopeless. The golden rule is, "Always examine the throat of a sick child no matter what the symptoms are." The physician who fails to diagnose diphtheria because he did not look at the throat ought to be prosecuted for malpractice.

2. He examines the throat and thinks he has a case of tonsillitis or coryza or croup to deal with; or that, even if it is diphtheria, it is so mild that the old-fashioned remedies are sufficient for its cure.

3. He fails to follow up a suspicious case and finds too late that the patient is in a desperate condition.

4. He treats one amongst many children and fails to protect others exposed to contagion by a preventive injection.

5. He uses antitoxin, but is half-hearted and does not use enough.

6. In a case of laryngeal diphtheria he uses antitoxin—perhaps in large doses—but fails to make an early resort to accessory remedies such as calomel fumigation and intubation.

7. He makes an early diagnosis but puts off the injection of antitoxin until to-morrow or the day after.

For myself I must confess I have made all these blunders, and have had occasion more than once to bitterly regret them. But it is now some five or six years since I have had a death from diphtheria in my practice. I well remember the last two I lost. In one I was called in to see a sick child; it had a discharge from the nose, but on carefully examining the throat I found no membrane. The parents told me they would let me know if the child was not doing well. Three days later I was called in and found the child dying from laryngeal and nasal diphtheria. In the other case I diagnosed herpetic tonsillitis, because the spots were confined to the tonsils—small, white and discrete. Some four or five days later I was called in to find the child—who in the interim had been playing on the street, and doubtless spreading the disease among the neighbors—dying of laryngeal stenosis.

I had a couple of similar experiences in which the result was not so deplorable, but my culpability was as great.

Catastrophies like these caused me to ask myself—"Can they not be avoided?" "Is it possible to always diagnose diphtheria at the first visit?" "Can I afford to wait from one to three days for a bacteriological report?" "And can such report always be depended upon?" The conclusions I have arrived at are that such catastrophies almost always can be avoided; that it is often not possible to diagnose diphtheria at the first or any other visit without bacteriological examination, and I believe firmly that a bacteriological report is not always to be depended upon.

The Toronto Board of Health has an exceedingly efficient and painstaking bacteriologist—so has the Ontario Board of Health. And yet both will, I think, admit that they have made many negative reports where the subsequent course of events proved beyond any reasonable possibility of doubt that the swabs were taken from a case of diphtheria. I could quote some examples from my own practice, but the following three cases will serve to illustrate the difficulties:

1. Dr. Dwyer reports the case of a Toronto physician, swabs from whom were repeatedly examined by both Prof. Amyot and Prof. Shuttleworth, without any diphtheria bacilli being found. And yet severe—indeed almost fatal—paralysis, involving the arms, legs, throat, larynx and heart, supervened, and two others in the family developed the disease.
2. Dr. Nevitt reports the case of a young woman who had a violent sore throat—clinically, diphtheria. To prevent the spread of infection to the children in the house he sent her to the Isolation Hospital. Repeated examination failed to reveal the presence of diphtheria bacilli, and yet she developed well-marked paralysis.
3. Dr. Uren reports the case of a girl aged twenty sent by him to the Isolation Hospital as a case of diphtheria. In four days she was sent home, as no diphtheria germs were found. But three weeks later extensive and serious paralysis supervened.

I need not multiply examples, for it is admitted that for some mysterious reason we may fail to get diphtheria germs from swabs taken from undoubted cases of diphtheria.

Having arrived at the above conclusions, I asked myself,, "What are you going to do about it?" And the answer was evident—take no chances. In every case in which there is even a suspicion of diphtheria give antitoxin at once, and give it freely. Get a report in every doubtful case, but do not wait for the report but inject at once. As soon as bacteriological examination shows the presence of diphtheria bacillus give an injection to all the children of the household to prevent the spread of infection. Of course isolation and other methods of preventing the spread of infection must not be neglected, but neither must the preventive injection. Doubtless, if this practice is carried out, many unnecessary injections will be given. I have often injected antitoxin and found as a result of bacteriological examination that the case was not one of diphtheria. But what harm has been done? I have never seen any bad results from the injection. In fact, it has been my experience that the cases of membranous tonsilitis thus treated seemed to clear up more rapidly than those treated otherwise, and many physicians have expressed to me the same opinion.

There is but one serious objection—that of expense. But in my opinion prevention is cheaper as well as better than cure, and it would be cheaper for the municipality to supply physicians with preventive injections for the poor than to have the diphtheria hospitals crowded with patients kept for an average period of five weeks at an average expense of well on to a dollar a day.

There is nothing like a local examination to illustrate a truth, and this is supplied in the experience of the Victoria Hospital for Sick Children with preventive injection, as related by Dr. Rudolf in a recent article in the British Medical Journal.

In 1901 about one hundred cases of diphtheria developed in the hospital, nearly all of which were treated with antitoxin. Of these only three died, and one of these was complicated with scarlet fever. Between January 1 and July 7, 1902, forty-two cases (all showing Klebs-Lœffler bacillus) developed. All, except a few of the mildest, were treated with antitoxin. Forty-one recovered, and the last one that died developed uremia due to kidney disease that predated her admissioon to the hospital. For five years there had never been two successive weeks in which diphtheria had been completely absent from the hospital. Early in July, 1902, a determined effort was made to stamp out the disease by the injection of immunizing doses into all the patients. The result was most gratifying. For the five months reported not a single case of diphtheria occurred in the hospital, though the usual number of cases had been occurring elsewhere in Toronto. The germ was found present in the throats of many, but its hosts were immune and hence no diphtheria occurred.

The diagnosis of diphtheria is usually easy—often difficult—and sometimes impossible. A patient may have a sore throat, with diphtheria bacilli present, and yet no membrane forms. If exposure to diphtheria is known to have occurred, it is better to regard the case as one of mild diphtheria and treat it acordingly.

There are certain mild exudative inflammations of the throat in which it is quite impossible to say whether we have diphtheria or pseudo-diphtheria to deal with. They look exactly alike, and the symptoms and duration are the same. Indeed, so much alike are they that if we were called in and told that one case was diphtheria and another pseudo-diphtheria we should be quite unable to say which one was the diphtheria. Should we wait for a bacteriological report and risk fatal poisoning and involvement of the larynx? No! We should inject antitoxin and make it a practical certainty that our patient will recover.

A fatal source of error is to confound catarrhal laryngitis or the old-fashioned inflammatory croup with diphtheria of the larynx. When there is even the smallest patch of membrane in the pharnyx the diagnosis is clear, but unfortunately there are many cases of primary laryngeal diphtheria. We cannot be sure whether the laryngeal stenosis is inflammatory or membranous, and the only safe treatment is to inject antitoxin at once. Should subsequent events show the case to be one of diphtheria we have probably saved a life, and if not we have done no harm. I cannot be too emphatic on this point. Every case in which there is even a suspicion of laryngeal diphtheria should be promptly treated with antitoxin. Many years ago, in the pre-antitoxin days, I reported a series of cases treated with calomel fumigations with excellent results. Time and further experience have but confirmed the favorable opinion I then formed of this plan of treatment.

For the past ten years I have treated all my cases of laryngeal diphtheria as follows:

1. Inject antitoxin, full doses.

2. Fume calomel under a tent (30 grs. an hour) until stenosis is relieved.

3. Intubate early if symptoms demand.

I regret that I have not a full record of my cases, but the results have been marvelously good. Every case I have seen and diagnosed early has recovered.

The early diagnosis from scarlet fever has in some instances puzzled me very much. The diseases often co-exist in the same patient, and in some malignant cases of scarlet fever there is a very imperfect development of the rash—indeed the patient sometimes dies before the rash is due to appear. In three of my cases there was so much doubt that I injected antitoxin. In each the rash came out on the second or third day, and diphtheria germs were found in cultures from the throat. Dr. Tweedie tells me that there is mixed infection in about 16 per cent. of the cases admitted to the Toronto Isolation Hospital.

The diagnosis from ordinary follicular tonsilitis is not always easy, nor is it indeed possible in some instances. In fact mild diphtheria quite frequently occurs with the semblance of ordinary follicular tonsilitis. My rule is to have swabs examined from every case, and, when in doubt, to inject antitoxin. Whether the exudate is removable or not influences my diagnosis but little. It can sometimes be readily removed in diphtheria, whilst on the other hand it is quite adherent in many cases of pseudo diphtheria.

A syphilitic throat sometimes closely resembles diphtheria, but with care there is little probability of error.

The last source of uncertainty in diagnosis I shall deal with is nasal diphtheria—especially in the chronic form. An irritating discharge from the nose of a sick child should always excite suspicion and lead to careful inquiry even though no membrane be visible in the throat. I saw such a case in a child less than a week old who had an offensive discharge from the nose, though nothing could be seen in the throat. How it contracted the disease I do not know, but bacteriological examination showed the presence of the bacillus, and if additional proof were wanting, it was supplied by the fact that the mother of the child contracted a severe form of the disease from it.

I was recently called at midnight to see a child that had been ill for three days, the parents supposing it had quinsy because it had had an attack of that disease some little time before, and the symptoms were similar. I found the child desperately ill with nasopharyngeal diphtheria, but after an injection of 2000 units it made a prompt recovery: On looking for the source of contagion I found that a young man in the house—a salesman in one of our large departmental stores—had an offensive, irritating discharge from the nose for about two months which resisted ordinary treatment. Bacteriological examination revealed the presence of diphtheria bacilli in the nasal secretion. In spite of vigorous treatment it was some six weeks before he was free from infection, although he felt well and ate his meals heartily throughout the whole three months.

One who recognizes the uncertainties and difficulties of diagnosis, and is prompt, bold and fearless in his treatment, will have a very low death rate indeed.

I believe that antitoxin is an absolutely certain specific remedy when given in sufficiently large doses early in the disease.

The most fatal form—laryngeal diphtheria—causes death either from stenosis, broncho-pneumonia, or sepsis, none of which will develop if a large dose of antitoxin is administered on the first day of the disease.

Children with enlarged tonsils and adenoids are in especial danger and require a specially large dose.

The same is true of nasal involvement. Intubation as a rule is not done early enough.

For the ordinary case of pharyngeal diphtheria without nasal or laryngeal involvement, I find a single dose of 1000 units, if given early, quite sufficient.

Dr. Louis Cairns published a most interesting paper in the Lancet of December 20, 1902, on the intravenous injection of antitoxin. There are, he says, a certain number of malignant cases which show no improvement after the sub-cutaneous injection of even large doses (20,000 to 30,000 units) of antitoxin. He suggests two causes for its failure.

1. A selective influence on the part of the glands in filtering out the active constituents of antitoxin.

2. There is a definite chemical relation between toxin and antitoxin, and neutralization of the toxin goes on more quickly in concentrated solutions than in dilute ones.

He recommends an initial dose of from 20,000 to 30,000 units, injected into the median basilic vein, and the indications he gives for its employment in this way are:

1. Special malignancy of the disease.
2. Involvement of the lung, especially if this complicates laryngeal involvement.
3. A moribund condition when first seen.
4. Marked toxic symptoms.

He reports fifty consecutive cases in the Belvidere Hospital, Glasgow. Of these he considered twenty severe enough to warrant intravenous injections. Of the fifty but three died. Thirty-one of the fifty cases showed laryngeal and seven nasal involvement. Fifteen were complicated with broncho-pneumonia. In seventeen cases it was found necessary to perform tracheotomy, and of these but one died.

The first case in which intravenous injection was tried was of special interest. A girl two years old was admitted pulseless, with cyanosed lips and cold extremities—the heart beating 185 to the minute, respirations 60, laryngeal obstruction almost complete. Tracheotomy was performed, but the lividity continued and was found to be due to broncho-pneumonia. The urine was loaded with albumen; 6000 units of antitoxin were injected into the median-basilic vein. The patient continued desperately ill for two days, but on the third day mucus was expectorated freely and she steadily improved and made a perfect recovery.

In another case broncho-pneumonia developed in spite of the sub-cutaneous injection of 18,000 units of antitoxin. Tracheotomy was then performed and 22,000 units of antitoxin were injected intravenously. There was immediate improvement and prompt recovery.

Gentlemen, when we see how much can be done for malignant cases, am I not justified in stating that our death rate is too high?

SURGICAL ANESTHESIA IN CHILDHOOD

By A. F. Erdmann, M.D.,

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Fortunately few children succumb to an anesthetic. There are no special statistics subsequent to 1893, the year of the Lancet report; if such were obtainable, I would expect that the percentage of fatal cases reported since that year—forty-five patients under fifteen years among 600 of all ages—would be greatly lessened. Speaking generally, the child bears an anesthetic better than the adult. A representative report is that of the St. Mary's Free Hospital for Children (New York), whose record is that in thirty-five years there have been no deaths on the table. If all reports were like that, the anesthetist would feel easy about every narcosis in childhood. Unfortunately, we each of us privately know of too many fatalities. The child is safe if the anesthetic is carefully given—safer than most adults, for it has not yet overdrawn its health account, as so many adults have done; nor is it dealt with as carelessly as many adults are. I find that most anesthetists have an instinctive solicitude for the safety of a child and are more cautious when one is under their care. In addition to this, few of the major and severest operations are necessary in the earlier years of life. So the comparative immunity of children can be accounted for without giving the child great consideration. On the other hand, certain facts are well known, and if negligently regarded or entirely lost sight of, will rise up in the judgment of many unreported cases. Any narcosis is a serious attack upon a child's vitality. To prolong it by unnecessary delay, either by failing to complete important details of the operation before the anesthetic is begun, or by unreasonable slowness on the part of the operator, is a crime against the little patient. It is no less necessary to husband the child's body-heat by avoiding exposure to a low temperature either in the room itself or from a cold table or covering; and especially should an anesthetist be careful if the patient has lost a large amount of blood.

Childhood ends with puberty. Children's hospitals usually consider this period to be fourteen years. I have noticed that within this age-limit there are three well defined sub-periods: 1. From the time of the beginning of sentiency through the period of the first dentition. 2. The interval between that and the beginning of the second dentition, during which there is the development of intellection. 3. The transition period, from about six to fourteen, during which time the body is assuming more definitely the characteristics of the preadolescent stage. For the purpose of my paper, I am led to define yet a fourth, the earliest period, that of the fœtal life. To consider the peculiarities of each of these stages of the child's development requires more time than is at our disposal this evening. It will have to suffice that mention is made only of those features which have an immediate bearing upon the subject under consideration. So I endeavor to frame a reply to this question. In what particulars does a child differ from an adult that it should be treated in a manner peculiar to itself when subjected to a general, an inhalation anesthetic?

During its intra-uterine existence, the child is affected by changes in the maternal organism through the intimate relations of their blood. It is certainly conceivable that an anesthetic agent which will penetrate to and affect the protoplasm of a cell of the brain is equally able to pass into the blood of the placenta; and that it does so is seen in the report of a case of fatal fœtal narcosis occurring in the course of a protracted delivery during which the mother was given forty-eight ounces of chloroform. Perhaps many another still-born baby died in the same way, and it is an open question whether many a child who was said to have been squeezed to death by a forceps was not quite as much poisoned by the anesthetic. The safe way is to use only as little chloroform as possible. Ether is not so safe for the fœtus because so much more of it is taken up by the maternal blood and by just so much more lessens its oxygen carrying power.

Up to the first two or three months after birth the infant retains many of the characteristics of its fœtal condition with respect to a narcosis. Cutaneous sensibility to pain is slight and sentiency is barely perceptible. At this time usually no anesthetic is required for the few if for any surgical interferences which may be necessary. I find that Benno Müller (Hamburg) takes the same view in his Handbuch-Narkologie—"Es ist sogar im algemeinen Brauch, ein Kind unter 1 Jahr nich zu narkotisieren."

At the Babies' Hospital (New York) it is a rare case which requires an anesthetic. Circumcisions are usually done without it. Dr. Satterwhite, the anesthetist at the Hospial for Ruptured and Crippled (New York) once anesthetized a child only a few days of age whose abdominal wall had to be sewed together to cover a bad condition of eventration. Even then he gave only a whiff and felt, he says, that even so little was hardly necessary.

At the New York Foundling Asylum it is quite the rule to give ether for every operation, regardless of age. It is not because the narcosis is dangerous to the child, but because what little has to be done can usually be done without.

It is when the infant has begun to find itself and to have pronounced likes and dislikes that the question of a general anesthetic must first be seriously considered. Three peculiarities of the infant must be kept in mind. 1. The naso-pharynx is of very small dimensions; a slight encroachment of the mucous wall upon its lumen may make it dangerously small. 2. The sternum and spine are very flexible; they may readily be distorted so as to disturb the relation of the thoracic contents. 3. The lung capacity is proportionately much less than at a later age; there is a greater abundance of connective tissue, the bronchi are larger and the alveoli are but rudimentarily developed. One is not surprised, then, that an infant cannot readily respond to conditions which require an extra amount of respiratory power. This may be the case if the upper air passages are narrowed by a congested state of the mucous membrane, or by a diminished capacity of the alveoli because of an engorgement of the pulmonary vessels, or even because of a faulty position of the trunk, or a careless pressure of an arm or blankets upon the chest.

These conditions necessitate the choice of an anesthetic which relieves in the best manner any tendency to a congested condition of the air passages, and a method of administration which insures full and free respiration. The preference is given to chloroform, though many operators will use nothing but ether. Personally, I am finding ethyl-chloride to be a very efficient agent. My paper before the Associated Physicians last winter covers this ground quite thoroughly (see *Medical News*, May 28 1904).

Concerning the method of administering, only this need to be said, that all the "don'ts" which are to be heeded in the case of an adult apply equally here; especially the cautions to keep the body warm, to maintain a free air way and to keep pressure off the chest. One particular point needs to be remembered, that a child's head cannot be placed in a position of extreme extension without incurring the danger of blocking the fauces. The manipulation of the lower jaw must be mainly relied upon to maintain open air passages.

By the end of the third year, with the completion of the first dentition, the infant is fast losing its immaturity. The anesthetist now has to deal with lungs which are in a state of complete functional activity; the character of the respiratory movement is more pronouncedly abdominal and has decreased in rate from 45 to about 40 at three years and 25 at five years; while the heart has not yet fully assumed its adult position, for the apex beat is to be located in the fourth interspace, it is more securely anchored and is confined in a less flexible thorax.

The pulse rate has decreased from 110 to about 75 at the end of the second year, and continues until, at the age of five years, it is usually about 90.

It is at this time that the manner of administration becomes more important. Shall the child be forced to take the anesthetic or will one allow the child to take its own time? There is no uniformity of opinion on this question. It is a matter of individual aptitude as well as depending upon the occasion and the disposition of the child. I have found that most anesthetists prefer to let the child have its own way, for then they obtain a calmer anesthesia and are better able to control the anesthetic. It happens, though altogether too frequently, that the anesthetist is hurried and cannot do as he pleases, but must, willy-nilly, force the anesthetic. This is the practice in a certain institution when the yearly round-up of tonsilotomy and adenectomy cases is made. An assistant starts the etherization and then, before the child is fully under the anesthetic, passes it on to the anesthetist, who completes the anesthesia and holds it until the operator is ready for the case. In this manner thirty or forty operations are done in an hour. In private, also, one is sometimes confronted with the necessity of simply holding a child by main force and compelling it to inhale the anesthetic. In such cases I strongly favor using ethyl-chloride or one of the mixtures A. C. E., or one of the Schleich solutions, or Anesthol. They are rapid, pleasant and can be pushed with safety. If a drop of some volatile oil—eucalyptus or gaultheria—is sprinkled upon the cone it will disguise the anesthetic odor somewhat. The cries and coughs but hasten inspiration. I have never had occasion to notice that the psychologic shock was severe or that the danger to the heart is in any way as great as in the case of an adult. Some children will submit very readily, and if one has plenty of time and will use some tact, most every child can be sufficiently persuaded to yield, may be, though a reluctant consent, to the imposition of the inhaler. If one will remember always that both ether and chloroform are heavier than air, it will be easy sometimes to give them enough to get used to the smell of the anesthetic even by holding the cone some distance above the face. It is of no little importance to use some form of an inhaler which is as unlike an instrument as possible. I was much interested to notice that in the New York hospitals particularly they are doing something which I have been practising for some time. That is, to use a so-called paper and towel cone. It is easily put together, is clean, and, best of all, does not frighten the child. (For a description with illustration, see *Medical News,* May 28, 1904.)

At this age chloroform is not generally employed; yet there is no objection to its use if carefully handled. The very fact of the relatively greater strength of the heart in a child than in an adult, the rare presence of disorders of the circulatory apparatus, together with the acknowledged greater susceptibility of the kidneys and lungs to inflammatory changes, would seem to give chloroform an *a priori* advantage. I believe that custom has a great deal to do with this matter, for certainly in other parts of this country and in Europe a great deal of chloroform is used.

An unpleasant feature of the course of the anesthesia in children is the uncertain behavior of the eye. The child's eye is uncanny; it may remain wide open, but it is not glassy; sometimes the eyeball rolls about in an annoying fashion; occasionally one cannot place any reliance upon the pupillary reflex. Extremes should always be guarded against, especially any sudden dilatation of the pupil from a condition of marked myosis. The pulse may be very rapid—110 or 120 is not alarming; the respiration rate may be much accelerated. But it is the character of these signs which indicates the condition of the patient, and their inter-relations. Of special importance is the appearance of the patient. A blue color is less to be feared than a deepening leaden, ashy pallor. I am always afraid when the lips begin to grow white and the tip of the nose and the ears turn a dirty yellow. A safe rule always is, "when in doubt, stop." Supposing it does mean that the patient vomits and shows you were mistaken as to the depth of the narcosis. Any one who has once anxiously watched for the first faint sigh of a returning respiration will risk a rebuke or ridicule rather than lose a life.

The third period of a child's life is one of a state of nervous instability. It must be treated with all due allowence for a tendency to emotional changes and disturbances of the cerebrospinal system due to rapid development and active molecular change. Hence, the initial stage of the narcosis is of most importance; the course of the anesthesia follows more closely that of the adult. I should now hesitate to force an anesthesia; yet it requires all the tact one possesses to overcome the timidity, and even fear sometimes, which one meets. At this time the so-called "lighter" anesthetics are valuable. The nitrous oxide gas can be used with great advantage as a preliminary to ether; the close-fitting face-piece and the bag are no longer likely to be a source of dread. Gas is not the ideal anesthetic for children. There is no ideal, to be sure. If ethyl-chloride shall prove to be able to quiet the muscular twitchings which are so annoying oftentimes when gas is employed, and can be given long enough to overcome all muscular rigidity, to that degree it will be better than gas, and in so far as these agents can be used to shorten the time of an operation they will be preferable to both ether and chloroform. If to no further extent, they should precede the others to allow of a more rapid and a more pleasant anesthesia.

Within this period probably most operations for either enlarged tonsils or hypertrophied post-nasal adenoids are done. This phase of the subject opens many interesting questions. Not the least vexatious one is that of the position of the child—in the anesthetist's lap or seated in a chair, or on the back or in the Rose position. Shall there be complete anesthesia or only the primary stage, the so-called "talking" anesthesia? Ordinarily Dr. Sturges' practice at the Seney Hospital (Brooklyn) is to be commended. The arrangements are made as for any operation, the patient is in the dorsal position and the anesthetist maintains a complete anesthesia. This, however, may not be practical, except with sufficient assistance. In private work Dudley's (Brooklyn) plan, to tie the child into a chair, does very well. The anesthetist can be of some assistance to the operator, especially if he will use the simple device for feeding the ether mask, which I will describe later. If now only a talking anesthesia is maintained, the fauces can be easily kept clear of blood and mucus. To the importance of protecting the lower air way, Bennet (New York) calls particular attention in a paper in the April, 1904, *Laryngoscope*. He cites in this connection the method devised by Crile (Chicago), who introduces heavy-walled rubber tubes through the nostrils to a point in the pharynx opposite the top of the larynx, respiration taking place through the tubes, and the anesthetic applied in this manner. The mouth is kept open and the tongue pulled well forward, while the space thus formed at the back of the pharynx is packed tightly with gauze.

Not many of the major operations are performed on children. Of more than 400 operations done during one year at the St. Mary' Free Hospital for Children (New York), out of a total of 1,000 cases less than 10 per cent. were of any magnitude. The operation itself, then, need have no further particular mention in this paper. It is interesting, however, to notice that many of the operations in this report, which is probably a typical one, deal with conditions which reveal some impoverished state of the blood or a lowered vitality. The anesthetist must always carefully note the general condition of his patient, and be on his guard that anesthetic plus operation plus lowered vitality be not greater than the resisting power of the organism. Of the general conditions which predispose to danger, first and foremost is the *status lymphaticus*. I found an editorial in the *Medical News* in the spring of 1902 which quoted a report from the Children's Clinic at Gratz that all the deaths occurring there during the past twenty years were in patients in whom this condition was proved at the autopsy. I do not know that I ought to do more than just mention this matter, for a most excellent article on the subject appeared in the January, 1904, number of PEDIATRICS. Suffice it to say that the *status lymphaticus* may be suspected in a child whose superficial lymph glands generally are involved—those in the neck and the axilla, the tonsils, the pharyngeal lymphatics, the circumvallate papillæ of the tongue. The spleen may be palpable. The child appears to be in perfect health, may be a trifle too fat, and perhaps the skin is thin and pale: the complexion pasty. If one encounters such a child it is undoubtedly best to avoid chloroform. Concerning rachitis and scrofula, one can say only what might be said of all depraved conditions. Conserve the strength, hurry as much as possible, use the least possible quantity of the anesthetic. Let the child have nourishment as late as possible before the operation, according to its condition and the nature of the meal. The same rules are operative in these cases in children just the same as in adults.

Concerning the induction of anesthesia while the child is sleeping, I have only to say that it can be done and is a good practice. The difficulties are that one is likely to give too strong a vapor, and to attempt it during a light sleep. Dr. Satterthwaite has had some excellent results at the Hospital for Ruptured and Crippled (New York). It frequently happens that the children fall asleep while waiting for the operation, and on a number of occasions he has been able to effect a narcosis without the child's knowledge. Such cases have been reported here, too. It has been the pleasure of my own experience as well. Only this morning I succeeded in continuing the natural sleep of a baby boy into the anesthetic sleep. It was specially desirable in this instance, for it was thought to be objectionable to let him become aware of the slight operation which had to be done about the prepuce. It is a procedure which deserves wider practice.

I fear I have left many important matters unsaid, but I hope I have touched the salient points of the subject.

In conclusion, permit me to show you the only new appliances which I have been able to find. This tubular spring is to slip over the ordinary Allis rubber cover so as to make the face opening fit any size face. One or more may be used for a child's face. By its means the regular adult size inhaler can readily be made small enough to fit even an infant's face. This other, a bulb ether container, is fitted, as you see, with a sharp-pointed metal nozzle, so that it can be stuck into a towel cone and enable the anesthetist to manipulate the cone and control the ether supply with one hand. Tieman has made both of these for me. I have found them very handy. Dr Tucker, of the Eye and Ear Hospital (Brooklyn), taught me a trick the other day which I have used with good results. It is to fold several thicknesses of gauze over one end of the Allis instead of threading it. I like that, because I can place one of these 5 grm. tubes of ethyl-chloride in my modified Allis inhaler, put on the cover and obtain a quick and pleasant anesthesia while completing the anesthesia by introducing ether through the side opening.

DEFECTS OF EYES, EARS, NOSES AND THROATS IN SCHOOL CHILDREN.*

By A. W. Hawley, M.D.,
OF SEATTLE. WASH.

The object of this paper is to awaken an interest in this important subject, and to enlist your support and co-operation in establishing, throughout this State some systematic plan for the detection and correction of these defects in school children. Systematic examinations of school children are now made, annually, in Connecticut under a state law, and in New York, Illinois and Texas under the directions of the State Boards of Health and the Boards of Education.

Statistics from the work of many individual investigators clearly show the necessity of such examinations. It is unnecessary to give a detailed report of these investigations. It is sufficient to say that in general from 30 to 40 per cent. of all school children have some refractive error, and that from 15 to 25 per cent. suffer from defects of the ears, nose or throat. To determine in a measure the condition of the school children, the writer examined over 400 pupils in three of the largest schools of this city. The results of this work demonstrate that the children of this city are no better off than those of other cities, and that there is need of action on the part of this Association and its individual members.

In the examination of the 400 pupils of the city schools, the vision of each was tested by the ordinary chart of Snellen's test letters place in good light, 20 ft. (6 meters) distant. An ophthalmoscopic examination could not be made because of the lack of proper facilities as to light or room. However, this was not essential to the value of the work. The nose and the naso-pharynx were examined, whether any complaint had been made or not, which resulted in the detection of a number of cases of adenoids and hypertrophied tonsils. The hearing was tested by tuning fork and by the whispered and spoken voice whenever suspicion pointed to ear trouble.

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*Read before the Washington State Medical Association, Seattle, Wash., July 12-14, 1904.

Acknowledging that this examination was by no means complete or perfect, nor all that could be desired, yet its results are sufficiently accurate to be of value in this discussion.

At the B. F. Day School over 165 scholars were examined, with the following results:

Ninety-seven, or 58 per cent., had some refractive error, vision being reduced to 6-9 or less.

Seventy-eight, or 47 per cent., had adenoids and hypertrophied tonsils, or both.

Twelve, or 7 per cent., had defective hearing or chronic suppurative otitis media, or both.

At the Central School over 160 scholars were examined, of whom

Seventy-eight, or 48 per cent., had some refractive error, vision being reduced to 6-9 or less.

Eighty-two, or 51 per cent., had adenoids or hypertrophied tonsils, or both.

Twelve, or 7 per cent., had defective hearing or chronic suppurative otitis media, or both.

At the Rainier School over 95 pupils were examined, of whom

Forty-one, or 43 per cent., had some refractive error, vision being reduced to 6-9 or less.

Fifty, or 52 per cent., had adenoids or hypertrophied tonsils, or both.

Six, or 6 per cent., had defective hearing or chronic suppurative otitis media, or both.

The percentages just given, of the defectives in our city schools, are considerably higher than those obtained from similar examinations in other cities. This is explained, however, by the fact that the children examined were selected by the principals because they were deficient in school work, or were supposed to be defective in some way.

In testing the vision of these children it was impossible to make a differential diagnosis between myopia and hyperopia, or astigmatism in all cases, on account of the lack of facilities for a proper examination. This would have been desirable and instructive, as the records of other investigations show that myopia is found with increasing frequency as the higher grades are reached, while, at the same time, the frequency of hyperopia decreases in almost the same proportion.

Erisman, in 1871, examined 4,368 scholars in St. Petersburgh, with the following results:

Class—	1	2	3	4	5	6	7	8	9
Myopia	13.6	15.8	22.4	30.7	38.4	41.3	42.0	49.8	41.7
Hyperopia	67.8	55.6	50.5	41.3	34.7	34.5	32.4	36.2	40.0

This increasing frequency of myopia and its deleterious influence upon the development and education of the child, has led to numerous investigations as to its causation. The conclusion is nearly unanimous that it depends much more on the demands made upon the eyes, by modern civilization and education, than to the influence of heredity, race or cranial formation.

At birth practically all eyes are hyperopic, and with age, progress towards emmetropia or the normal eye. The influences which prevent this beneficial change taking place, or delay its progress, are not entirely determined, though probably they are the same that produce the myopic increase.

The effect of education and intellectual advancement upon the eyes is most clearly shown by a comparison of the results of investigations made among the educated and the illiterate races. In Germany, probably the home of the most intellectual people of the world, as high as 50 per cent. of the students in the more advanced seats of learning were found to be myopic, to say nothing of hyperopia or astigmatism. In our country, in a number of cities, as high as 40 to 50 per cent. of the pupils are found to have ocular defects.

In Mexico, Ramas found, upon the examination of 2,000 school children, but 88 myopes, 60 hyperopes and 10 astigmatics. These defectives were all found among the mixed types, the pure Mexican being practically free from error.

Though hyperopia and astigmatism are not found as frequently as myopia, nor fraught with as much danger to the integrity of the eye, they are the cause of much suffering and are a great hindrance to the educational advancement of the child. Many a scholar's mental activity is greatly reduced by the suffering caused by these refractive errors. It is not an uncommon occurrence to transform the indolent, stupid, irritable, fault-finding scholar (even the school "dunce") into a cheerful, industrious, bright, active pupil who readily takes his place at the head of his class, by the correction of his refractive error with properly adjusted glasses.

The deleterious influence of ocular defects upon the mental and moral developments of the scholar will be best shown by the report of a few cases taken from the examinations recently made.

Case I.—E. S., age sixteen. Complained of headache and pain in the eyes, especially after reading or doing any close work. She was nervous, restless, and somewhat irritable. It was found necessary to give up some of her studies, and finally all school work for two weeks at a time because of the intense headaches and distress. Vision was found to equal 6-60 in each eye. Retinoscopy proved the error to be myopic astigmatism, refraction, 1.00-.50; ax. 180 in each eye, the correction of which by spectacles has entirely relieved all discomfort, and enables the patient to pursue her school work without interruption.

Case II.—J. V., age twelve. Complains of headache, nausea and dizziness, especially when at school. During vacation time she is entirely free from these symptoms. Vision equals 6-9 in each eye. Retinoscopy proved error to be a hyperopic astigmatism of comparatively small degree, the correction being plus 25 Sph. plus .50 cyl. ax. 90 for both eyes; which gives vision of 6-6. This correction worn constantly relieves all distressing symptoms, and permits her to continue school work in comfort.

Case III.—C. L. H., age eight years. Complains of headache when at school; can not see work on blackboard; is inattentive and restless; makes little or no progress in school, and is considered very backward. Vision, R. E. 6-18; L. E. 6-12. Retinoscopy proved error to be a hyperopic astigmatism as follows: R. E. plus .75 sph. plus 2.75 cyl. ax. 105; L. E. plus .75 sph. plus 2.00 cyl. ax. 105; which gives him vision of 6-9.

A decided improvement has occured since he has been wearing the glasses.

Case IV.—N. H., age about 10 years. General condition poor, suffering from adenoids and hypertrophied tonsils, which are responsible for a bad nasal cartarrh; considerable deafness and suppurative discharge from right ear. Vision, R. E. 2-40; L. E. 2-40 (there is not much more trouble that she could reasonably be expected to possess). Teacher reported that she was doing practically nothing in school. Since having the myopia corrected and the adenoids and tonsils removed, she has become a comparatively strong child, and is succeeding in school quite well.

At the same time this child was examined, another was seen who was in practically the same conditions. Her parents will do nothing for her, probably through ignorance, though they have been urged by the principal of the school to have her treated.

These cases are a fair sample of the many found in the examination of school children. They are not extremes in either direction, and should help to prove the necessity of some systematic work in this direction.

About 50 per cent. of all those examined were found to have adenoids or hypertrophied tonsils, usually both. The detrimental effect upon the ears and the mental and physical development, particular of adenoids, is often very pronounced. The symptoms produced by adenoids are mouth-breathing, a want of proper nasal tone to voice, catarrh and colds which are frequent and more liable to occur on slight exposure, facial expression dull and listless. The aural symptoms, while not constant, are sometimes the first to attract attention to the naso-pharynx; earache is of frequent occurrence and commonly followed by a discharge; deafness and a sense of fullness in the ears is often complained of.

The report of one or two cases will serve to show the harmful effects of these conditions.

Case I.—I. B. W., age ten. Constant sufferer from colds and catarrh; frequently confined to bed with sore throat; physical condition very poor; appetite capricious; mentally rather stupid and dull; nervous, restless, excitable and irritable; breathes through mouth, nasal respiration being practically impossible; snored so as to be heard all over the house; voice wanting in proper nasal tone. At school always behind her class and below in her averages. The removal of the adenoid vegetations and the enlarged tonsils has changed the entire picture. She is strong and healthy—a good natured child —perfectly able to keep up with her classmates, and easily obtains marks above grade in all branches.

Case II.—C. M. Suffered from deafness, both ears, though no discharge; mouth breather; could not breathe through nose day or night; general health only fair; was not progressing as well as other children. A diagnosis in this case had been made of impacted wax as cause of deafness. Removal of the adenoid vegetations and hypertrophied tonsils has wrought a complete change. The hearing is perfect and the child more active and attentive.

Deafness and aural diseases are so closely associated with adenoids, in children especially, that any involvement of the ear should at once excite suspicion as to condition of the tissues in the pharynx and naso-pharynx. The prevalent idea of the laity that an aural discharge is of little consequence and will recover if left to itself, should be corrected. Many can trace their deafness to this idea. Besides deafness the involvement of the mastoid, with its train of complications, is frequently one of the serious results of neglect to properly care for a suppurative otitis media, acute or chronic.

Good hearing is of equal importance with good vision in the acquirement of an education. The proportion of defective eyes and ears among our school children is quite large. The educational loss to these children is very great. Means, therefore, should be provided to prevent as far as possible this great loss. Action is necessary.

I wish to present for your consideration the following:

Whereas, The deleterious influence exerted by defects of the eyes, ears, noses and throats of school children upon the mental, moral and physical development is not fully appreciated by educators and the public at large, therefore

Be it Resolved, That it is the sense of the Washington State Medical Association that measures be taken by the State Board of Health, the State Board of Education, all school authorities and, if possible, legislation be secured, looking to the systematic examination of the eyes, ears, noses and throats of all school children, that diseased conditions may be found and corrected.

Similar resolutions have been adopted by the American Medical Association, by the Mississippi Valley Medical Association, the Missouri Medical Association, and also by the State Medical Associations of New York, Illinois, Michigan, Colorado, Ohio, South Dakota and others.

The adoption of this resolution will be of little value unless some means be provided for carrying out its suggestions.

FRACTURES IN THE NEW-BORN.

By G. C. Trawick, M.D.,
OF NASHVILLE, TENN.

The statistics of some of the larger lying-in hospitals give a ratio of one fracture to each 250 deliveries. This is a frequency much greater than is ordinarily noted in private practice. It is very difficult to obtain any accurate statistics of this accident in private practice, on account of the failure of the attendant to report them, but the general practitioner will probably have one in about every 500 deliveries.

Fractures in the new-born occur in equal proportion to the number of operative deliveries. Almost invariably they are due to manual interference in delivery, under conditions that would sacrifice the life of the baby, and perhaps the life of the mother, without such interference. Fractures most frequently occur during breech extractions. Next in frequency come low forceps operations, plural births, podalic versions, high forceps, shoulder presentations, and embryotomy, in the order named. In any one of these complications, it may become necessary to fracture a bone of the fetus in order to save the baby. As the number of still-births decrease, there will probably be either an increased number of fetal fractures, or the number of induced labors.

There is no doubt, however, that a great many fractures result from the ignorance of the obstetrical operator; while he satisfies himself with the statement that it "could not be helped." The fractures most commonly resulting from ignorance are those of the humerus in breech extractions; fractures of the skull due to pressure through the abdominal wall in efforts to deliver an after-coming head; and multiple fractures in cases where violent obstetrical procedures have been performed, when induction of labor or Cæsarean section should have been done.

Cases have been reported of spontaneous multiple fractures in the fetus. Cazeaux mentions a child born after a rapid and easy labor, during which no force was applied, which had forty-three fractures involving the cranium and other bones. Another case is reported in which, after a very short and easy labor, a baby was born, bluish in color, and expired in a short time. Attention was called to it by its unusual shortness and great mobility in the continuity of its bones. One hundred and thirteen fractures were counted. The causes of this singular lesion are unknown; it is probably due rather to arrested development of the bony tissue than to fracture properly so-called.

Usually the fractures in a new-born babe are the result of manual or instrumental interference. They differ from other fractures only in their etiology, rapid repair, in frequency of complications, and in the application of apparatus to such small bodies.

Fractures by violence of uterine force alone, when a limb is caught between the hard parts of the mother and the body of the child, are very rare. Fractures of the skull pushed by uterine force through contracted pelves have been reported. Whether in manual interference or by uterine force, strain superior to the resistance of the fetal bone, exerted from without, through a comparatively short period of time, and with varying leverage, is the cause of these fractures.

In adults, the resistance of bone under normal conditions is said to be about that of cast iron. It has been demonstrated that a force of twenty pounds applied for one minute on the humerus of a still-born male child, with a leverage of one and one-half inches on each side of a fixed point, is sufficient to fracture the humerus transversely.

Uterine force is estimated at from six to three hundred pounds. In difficult labors, the force exerted by the uterus on a circle four and one-half inches in diameter—the dilated os uteri—is at least sixty pounds. If this force be deflected by the accoucheur's finger or instrument, against a point on a limb in the uterus or pelvis, such a force is more than sufficient to fracture the bone.

As predisposing causes of fracture may be mentioned: Weight of the fetus, the larger children being much more liable to fracture than their leaner fellows; sex of the child, male children being usually the larger, are more liable to fractures; early ossification of the bones, particularly the skull; position of the fetus, such as breech and transverse, or any condition requiring podalic version. Syphilis and rachitis are also common in fractures.

When the cranial bones are fractured, the parietals are most frequently affected. The injury is usually due to forceps, though it may occur spontaneously in birth through abnormal pelves. The fracture may or may not be followed by hemorrhage external or internal to the skull. The brain is liable to injury, but often escapes. When it is lacerated the injury may be quite serious. Intracranial hemorrhage may also cause death. If the fracture is compound, or if the depression be followed by symptoms of compression, as coma, subnormal temperature, and shallow respiration, there should be no question as to the propriety of elevating the bone. Depressions of the parietal and occipital bones usually correct themselves. But frontal depressions are commonly permanent. When there are no active symptoms or irritation or compression, no treatment is necessary.

Fractures of the jaw usually occur when delivering an after-coming head by the Smellie-Veit method, with finger in baby's mouth. While the danger of this accident must be borne in mind, yet it is not as frequent, nor as easily accomplished, as many text-books lead us to believe. Drs. A. B. Davis and Carmalt, of New York, report three cases of breech presentation, in which the fetus was known to be dead, where they found it impossible to fracture the inferior maxilla by this method. It takes an unusual amount of force, direct traction, to fracture the jaw. Most of these children are, fortunately, still-born, for the accident invariably leads to deformities in after-life. Dr. Lusk speaks of having fractured a jaw in an effort to convert a brow into a face presentation. The writer had the misfortune of fracturing the jaw in delivery of an after-coming head after version for prolapsed cord.

A fracture of the jaw can be held in position by a starch bandage around the head, or with a dental plate, and the child fed by gavage through the nose.

Fractures of the vertebral column have been reported, due to the Smellie-Veit method of delivering the after-coming head when the body of the child had been bent too far backward over the symphysis of the mother to save the perineum. In these cases probably the anterior spinal ligament gave way instead of the bone.

The awkward use of Schultz's method of resuscitation might fracture vertebrae.

A case of fracture of the ribs is reported by Gebhard, where a rib penetrated the lung after Schultz's method of resuscitation had been tried. Death of the child was caused by hemato-thorax.

Fracture of the sterum is unknown. It has been shown that the sternum may be forced back to the spinal column without fracture.

Fractures of the clavicle probably occur oftener than is generally stated, because the infant suffers very little inconvenience from the accident. It is usually caused by hooking two fingers over the shoulders in delivery of an after-coming head. Schultz's method will also occasionally cause a fracture of the clavicle. The force is one of torsion and bending, a combination requiring the least power necessary to accomplish a fracture.

The treatment should be the same as for adults. Sayer's dressing, applied for ten days, will suffice. If not treated, after two or three months a careful examination will usually not fail to reveal deformity.

Fractures of the scapula are practically unknown. Fracture of the humerus is probably the most frequent of all the fractures in the new-born. In the great majority of cases in which this accident occurs, a breech has been extracted, either a breech presenting or following podalic version. It rarely becomes necessary that a humerus be fractured in order that the baby be saved. In one case seen by the writer, the anterior arm became caught behind the symphysis, and it was purposely swept across the back of the baby, necessarily breaking it, for fear that further delay would endanger the child's life. In another case, after delivery of the head in a normal vertex presentation, the shoulders became jammed into the pelvis, because of extension of both arms. Two fingers of the operator were hooked into the axilla, and with great difficulty an arm was delivered after purposely fracturing the humerus. The babe was still-born, weighing seventeen pounds. In breech cases, or after version, upward displacement of the arms is usually caused by traction on the legs and the omission of suprapubic pressure in the extraction. The arms being extended by the head, descent of the latter is effectually prevented. The arm which is most accessible must be first delivered, the child's trunk being swung well forward if it is the posterior arm, or backward if anterior. The fingers must be passed upward to the elbow and the arm swept in front of the baby's face. The trunk is then swung to the opposite side and the other arm delivered. The greatest care is necessary to avoid injury to the arms. In narrowed pelves, under conditions when rapid delivery seems essential to the life of either mother or child, the act of sweeping a child's arm across its face is accomplished with great force. In such conditions breech extraction always endangers the child's arms.

Deformity is usually the result of improper treatment, but in time corrects itself. Musculo-spiral paralysis has been noticed. This may also take place from too tight bandaging, and has been due to inclusion of a nerve in the callus.

In treating this condition, a plaster-of-Paris case around the chest, and the arm bound to the case after reduction of the deformity, either with plaster, starch, or ordinary gauze bandages, meets all the requirements of immobilization. If not applied with care, this may impede respiration. A towel folded over the chest, and removed after the plaster is hard, prevents that danger. This dressing may cause erythema, desquamation, and erysipelatous-looking eruptions, which render the patient uncomfortable. Drying powder and white flannel beneath the dressing usually eliminates this difficulty. If the arm be bandaged in a well-padded case, there will be no danger of gangrene or of musculo-spiral paralysis due to pressure. It is well to caution the nurse against permitting the child to lie on the injured side, even if well protected by a solid case. Splints are exceedingly unsatisfactory, because they slip readily and cause permanent deformities, which may require refracture. Such slipping may cause delayed union. If plaster-of-Paris or starch bandages be not used, it is better to bandage the arm to the side of the chest with cardboard on the inner side of the arm, because then there is less liability to displacement than with splints. The enforced absence of bathing does the child no harm, and may have distinct advantages.

Fractures of the forearm are very uncommon, and may be managed very similarly to those of the humerus.

Three cases of fracture of the pelvis at the sacroiliac joint are reported by Ruge. As the pelvis of the fetus is relatively smaller than the shoulder or head, and well covered, there is very little danger of its breaking.

Fractures or dislocations of the femur are certain to occur if the baby's leg be extended behind its back in breech presentation or podalic version. In these conditions, the leg should be flexed on the thigh, and the flexed limb rotated inward and extended across the abdomen. Traction with a blunt hook in the groin may fracture the femur. The writer broke one femur by a too zealous traction in the groin with the fingers. Shortening is very apt to occur if the fracture is in the upper third of the bone. As this is the usual site, shortening is very common.

In treating these fractures, the method of Dr. Wyeth will probably give the best results. Flex the leg upon the thigh, and the thigh upon the body, until the fragments are in accurate apposition, then fix by plaster-of-Paris cast left on for two weeks.

A double Liston splint from axilla to heels, with a cross bar at the feet, separating the thighs for convenience in dressing and cleansing, is good when the fracture is in the lower third of the femur. Immobilization is thus more securely maintained than by a single splint.

The administration of the thyroid gland in treatment of fractures is at present being experimented with by some investigators. That its administration has some influence on the growth and development of bone is well-established. It also causes a marked increase in stature. Some writers claim that in cases of retarded growth from rickets or albuminuria, as well as infantile myxedema, the use of the thyroid extract will cause increase in the length of the long bones, provided ossification of the epiphyseal cartilage has not taken place. It has been demonstrated that the bones of animals from which the thyroid gland has been removed show changes very similar to those which occur in infantile myxedema. They consist mainly in arrest of growth in the diaphysis—a slow ossification of the epiphyses of the long bones. Considering these facts, some were led to watch the effect of removal of the thyroid gland in cases of fracture artificially produced in animals. They claim that union was markedly retarded in many instances. From such observations as these, some hopeful therapeutists tried the effect of administering thyroid extract in delayed union fractures, and have reported quite a number of cases apparently cured by this means alone, after several usual methods failed. In a case of compound fracture of the leg, which massage and immobilization failed to cure after twenty-four days, under thyroid, consolidation took place in a few days. Another case of fractured rib, which had not reunited after thirty-five days of the usual treatment, had firm union on the tenth day after giving thyroid. This treatment is not devoid of danger, and should be resorted to only after mature deliberation.

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PEDIATRICS SECTION, NEW YORK ACADEMY OF MEDICINE.

December 8, 1904.

Dr. David Bovaird, Jr., in the Chair.

Rachitic Fracture of Femora.—The great difficulty of diagnosing this case, presented by Dr. La Fetra, made it of especial interest. At the age of 21 months the infant had been unable even to sit up without support. The spleen and liver were enlarged, the humeri and radii were bowed, the tongue protruded, and sweating of the head was noted. Hyperplasia of epitrochlear and inguinal glands was also present. Swelling and tenderness were evident at the middle of the shaft of the femora, and there was an angular deformity of the femora with convexity outward. It had very much the appearance of the simple antero-external deformity of rickets without fracture, but the tenderness at the middle of the shaft told against this diagnosis, and a radiograph revealed a green stick fracture of each femur.

Improvement of Erythema Induratum under Treatment. —A boy of three and one-half years of age was presented by Dr. La Fetra, who first saw the patient in June, 1903. The boy had never been exposed to tuberculosis, had never had fever or night sweats. The spots of erythema induratum were more evident to the touch than to the eye, and were distributed pretty much over the whole body. Before the eruption appeared the boy had a dactylitis which opened spontaneously. No tubercle bacilli were found in the pus. Dr. Lartigau excised and examined a nodule on the patient's left hand and found tubercle tissue and bacilli, and a mass of cheesy material. Strangely enough, although the boy had had measles and lobar pneumonia the previous winter, both favorable to tuberculosis of the lungs, and the lungs have remained perfectly healthy. There is no general glandular involvement. The treatment consisted of guaiacol in minim doses twice a day, and cod liver oil.

Dr. J. Sobel said that when the condition was diagnosed before the occurrence of ulceration the chances for improvement were better than with a late diagnosis. The appearance of the eruption on the face, trunk and upper extremities he thought somewhat unusual.

Dr. Bovaird said that when he left college he had supposed syphilis accounted for all swellings of the phalanges, whereas as a matter of fact, most of the cases of dactylitis which had come within his experience were tuberculous in character.

Cephalocele Occipitalis Inferior.—A female infant nine months old, was presented by Dr. Sara Welt-Kakels, who had first seen her three weeks before. The patient was the fifth child of healthy patients, breathed feebly at birth and was cyanosed. A tumor on the occiput was noted at birth, and had grown no larger since. The child had had whooping cough, and four weeks before had suffered from vomiting and diarrhea. She was poorly nourished, thoracic and abdominal organs normal. Thymus dulness was present, spleen palpable, liver somewhat enlarged, no sugar or albumin in urine. The tumor was covered with normal skin, was translucent and soft. It grew larger when the baby cried, and was reducible by pressure. An opening in the skull, apparently communicating with the foramen magnum, could be detected after reducing the tumor. The use of the X-ray revealed a faint shadow, possibly due to cerebral substance. Dr. Welt-Kakels referred to the old classification of such tumors as meningocele, encephalocele and hydroencephalocele, and said that their origin depended on the faulty closure of the cerebrospinal tube, which occurred about the second week of fetal life. Amniotic adhesions might occasion the condition. The prognosis she considered bad, although surgery offered encouragement.

Method of Obtaining Urine from a Female Infant.—A method by the use of a small bottle and a piece of adhesive plaster split into a four-tailed bandage was demonstrated by Dr. Welt-Kakels.

A Case of Depressed Fracture of the Skull, Showing Marked Mental Improvement after Operation.—The patient was presented by Dr. B. V. D. Hedges. The fracture occurred six years ago, at which time the boy was a perfectly normal child. After the accident his character changed entirely. He was vicious, violent in temper, dishonest, indecent and devoid of affection. After four years of this distressing experience his mother brought him to the hospital, and the entire area of depressed bone was removed, the operation resulting in his restoration to normal development mentally and morally. The importance of the case lies in its bearing on the functions of the frontal lobe.

Hypertrophy and Stenosis of the Pylorus in Infants.—A paper on this subject was read by Dr. F. L. Wachenheim, who added one more case to the small number (only 60) reported of this condition. In this case the infant, five weeks old, had suffered from uncontrollable vomiting after the second week, and from constipation alternating with some diarrhea and green stools. There was great emaciation and weakness. Limewater and very thin barley water were the only things that would stay on the child's stomach, and sometimes even these were rejected. The child died when seven weeks old and the autopsy revealed a hypertrophic stenosis of the pylorus, the pyloric end of the stomach being 3 cm. long and thick and hard like a new growth. It was 14 mm. in diameter, the duodenum 8 mm. Muscle, with a thickening of the submucous tissue, constituted the walls of the pylorus. No changes were seen in the mucous membrane, which had been drawn into lengthwise folds. Dr. Wachenheim thought that in the aggravated form of this condition, unless relief were obtained by surgical means, death would ensue within a few weeks. The following generalizations were drawn from the cases the autopsies of which are reported. The onset occurs at an average age of two weeks, and death at nine and a half weeks. He excluded from this class those who lived more than four months, since they often survived beyond infancy and even reached maturity, always somewhat troubled by symptoms of obstruction unless operated upon. Very few of the infants whose cases were reported were artificially fed, and improper food could therefore be eliminated in the consideration of the causes. The proportion of males to females in the cases reported was 2½ to 1. Forcible vomiting was characteristic. Free HCl was not invariably responsible for the acidity of the vomitus. The occasional occurrence of biliary vomiting with diarrhea and green stools made diagnosis difficult, and the delay occasioned by the necessity of close and prolonged observation was often fatal to the patient. Palpation was often powerless to detect the hypertrophied pylorus because the constant crying made the muscles of the abdomen so rigid.

Dr. Wachenheim reviewed the various opinions of clinicians as to the pathogenesis of this affection. Some believe that the essential element is spasm, affirming that the duration of the disease is too short to admit of more than moderate muscular growth, and that the autopsies show frequently only a slight stenosis. Others declare in favor of the opinion that the lesion is entirely anatomical. Dr. Wachenheim accepts the possibility of either condition, the prognosis being better when the trouble was due to spasm than when hypertrophy was pronounced. He also recognizes a possible combination of the two conditions in which either one alone would be comparatively without danger, but each reinforcing the other produced a serious condition. Absolute obstruction had never been found.

Dr. Wachenheim was inclined to think this affection more common than had been generally supposed, since it was not easy to diagnose, particularly when the digestive disturbances common in the summer were combined with it. Obstinate constipation and vomiting with gradual loss of weight was the combination to be watched for, and it should be remembered that the forcible character of the vomiting and its close relation to the ingestion of food were important. Almost no other disease showed an appetite above normal in conjunction with such a condition.

Treatment should be begun upon the assumption that the case was of the milder type. The diet advised by Freund consisted of breast milk and later whole milk, with the use of Carlsbad water. Thin barley water could be given frequently. Lavage sometimes gave relief. If no improvement in strength and weight was noted after two weeks' treatment the only hope lay in surgical intervention, and the mortality in such cases was very high.

Dr. Bovaird agreed that the number of cases of this affection was greater than generally reported, and commented on the fact that few appeared in American literature.

Dr. J. Dorning concurred in the difficulty of diagnosis, and said that even the symptoms considered classical might be confounded with those of simple gastritis. Palpating of the abdominal contents was very difficult except in cases of great emaciation where the abdominal wall was relaxed. He had found it of assistance to give a few whiffs of chloroform before attempting palpation, and had never encountered any bad results from so doing. He also remarked on the probable overlooking of many cases.

Dr. R. G. Freeman concurred in this opinion, but added that many cases were reported as such where there was no real stenosis, but merely a simple thickening of the gut.

Dr. Wachenheim said that in all the autopsy cases doubtful cases had been rigorously excluded. It was exceedingly difficult to discriminate precisely between a normal pylorus and a pathological thickening of the same.

Election of Officers.—Dr. L. E. LaFetra was elected chairman for 1905 and Dr. John Howland secretary.

EDITORIAL

GONOCOCCUS INFECTION IN CHILDREN'S INSTITUTIONS.

Probably no known infection is more to be dreaded in institutions tenanted by large numbers of young children than the gonococcus infection. This is true because of the unmanageable character it presents, and until comparatively lately its dangers were augmented by a large ignorance on the part of those whose duty it should be to guard against them.

The sheer good luck and natural resistant powers of the body which in some instances come to the rescue of institutions exposed by the carelessness or ignorance of their guardians seem to have been ineffective where this infection is concerned, and an infected child once received spreads disease unchecked among the other inmates. This state of affairs is not so much to be wondered at when we reflect that where only clinical symptoms are taken into consideration many cases must go undetected, even where the danger is recognized and watched for, and that in many minor institutions, day nurseries and the like, only the most obvious cases are treated and these in a wholly inadequate manner. That such conditions imply an appalling increase in gonorrheal vaginitis and arthritis, to say nothing of the threat of ophthalmia, is inevitable in view of the obstinate resistance of the infection even where it is fought with every precaution known to science.

The experience of the Babies' Hospital in New York City and the investigations made by Dr. L. E. Holt in regard to other institutions form at present the most significant body of literature in our possession upon this subject, and one that should be studied and taken to heart by everyone connected with the management of public homes, nurseries and hospitals where numbers of children are cared for.

In the *New York Medical Journal* for Saturday, March 18, and March 25, Dr. Holt recounts the struggles of the Babies' Hospital with the gonococcus during the past ten years. Up to 1896 no microscopical examinations were made, and cases identified by clinical symptoms received no treatment beyond the use of a boric acid solution when napkins were changed. Even when the opening of the clinical laboratory brought the microscope into use as an aid to diagnosis, the extremely contagious character of the disorder was not appreciated, and a boy of five months was allowed to occupy the same ward with two established cases of gonorrheal vaginitis. The fact that he developed gonorrheal arthritis and general pyemia was easily explained in the light of subsequent experience.

In 1899 the hospital experienced its first epidemic, starting from three children from a day nursery who were transferred to the country branch before the nature of their disease had been discovered. As soon as cases were discovered the patients were put in the infected cottage and cared for by separate nurses. The napkins from this cottage were washed separately, boiled and disinfected, but although the precautions prevented successfully the contraction of ophthalmia, the infection spread, and every girl in the infected cottage, which was used as a dormitory by the larger children, contracted vaginitis. A general house disinfection, as rigorous as that employed for scarlet fever, was found necessary to check the disease. Greater care in the admission of patients kept the following year comparatively free from trouble, but in 1901 three children, two of them from another hospital, started another house epidemic equally obstinate. The same precautions were employed, but no amount of napkin disinfection was effective, and it became necessary to stop admitting female infants entirely. The year 1902 was signalized by the recognition of the existence of some other portal of entry than the eyes or the vagina. Three cases of multiple gonococcus arthritis developed in the wards in patients none of whom had ophthalmia. One was a boy two and a half months old, and another was a girl of one year who had no vaginitis. In this year also the infection was introduced into the new hospital building by one case of vaginitis and one of ophthalmia, and in spite of every precaution, in absolutely clean new wards eleven new cases promptly developed, including three of gonococcus arthritis in boys less than ten weeks old. Within the first six months in the new building 29 cases of vaginitis and 8 of arthritis developed. Finally, in 1904 the rule was inaugurated to admit no female child without microscopical examination of the vaginal secretion, and if infection was found in children whose condition demanded hospital treatment, to place them under quarantine.

If so much difficulty was experienced in dealing with the matter in an institution with the equipment of the Babies' Hospital, it may readily be imagined what was the result of investigations among other institutions, and there is no doubt that Dr. Holt is justified in his conclusion that gonococcus infections, especially vaginitis, are steadily increasing in the city. This conclusion was confirmed by the discussion that followed the reading of his paper before the Academy of Medicine. That this increase can be checked only by the most extreme rigor of isolation and disinfection is evident when we find Dr. Holt establishing the fact that the contagion in the epidemics mentioned was conveyed by the nurses in the change of napkins. The precautions implied by this means of contagion are infinite in number and toilsome in nature, but absolutely essential if the ravages of the gonococcus are to be checked. The question of the portal of entry in gonococcus arthritis has not been solved, but Dr. Holt strongly suspects the mouth.

Space does not permit a recital of the prophylactic measures which have been found most effective. It can only be said that the invariable use of napkins on suspected children of any age, and a rigid quarantine extending to nurses and attendents must accompany strict measures of disinfection.

The most imperative need in the matter is for an awakening to the danger and a determination to fight it intelligently on the part of all who have the care of children in institutions.

RECURRENT VOMITING IN CHILDREN.

One of the most puzzling disorders encountered by the physician in the treatment of children is the recurrent vomiting which appears independent of errors of diet and accompanied by no pain save what can be referred to the strain of the vomiting. Some attempt has been made of late to study this matter, and it offers an interesting field for investigation.

There are wide differences of opinion as to its etiology and its treatment, but great unanimity as to its obstinate character. It has been known to appear as early as the second month, but generally after the first year, and tends to disappear as puberty approaches somewhere about the age of eleven years. Sometimes, but not invariably, a prodromal period is noticed characterized by malaise, headache, loss of appetite, coated tongue, and generally constipation, in a child previously well. The attacks vary widely in duration, from a few hours to several weeks, although the latter period has not been common and was broken by brief intervals of relief. The periods at which the attacks recur also vary markedly, from a few weeks to several years, although three months is probably about the most common period. While the attack lasts no food is retained, and retching sometimes becomes violent. Rapid emaciation results from practical starvation, but after the attack subsides, building up goes on as rapidly in its turn.

The first attack is easily confounded with acute gastritis, appendicitis, intussusception and other forms of intestinal obstruction in their early stages, or even with Addison's disease, as the marked pigmentation has been known to be present.

The prognosis is generally good, only four fatal cases being recorded. In two of these autopsies were obtained, but without conclusive results, the important feature in one case being an almost complete necrosis of the mucosa of the stomach and intestines, and in the other a fatty degeneration of the liver.

Almost the only constant symptom is the persistent vomiting, although constipation is common. Thirst has frequently been noted, and the abdomen may be either distended or retracted. There may be a tenderness in the epigastrium, and some headache.

Examination of the urine does little to clear up the problem, even when, as is the general rule, it confirms the presence of acetone indicated by the odor of the breath. Right at this point is where the "doctors disagree." Marfan believes the acetone to be the toxic factor and the vomiting due to acetonemia. Griffith thinks that the acetone is merely a guide to altered metabolism which produces toxins and eventually vomiting when no more toxins can be stored up. Holt thinks that a lithemic state is responsible for the condition, a view supported by a history of gout in the parents of some of the patients and, in one case observed by him, a diminution of uric acid excreted during the attack. Rachford, too, believes that a lithemic state exists due to an incompetence of the liver, producing autointoxication.

Edsall has a theory which he is able to support to a certain degree by success in treatment. He believes that the vomiting results from acid intoxication, calling attention to the similarity between the worst cases of this disorder and fatal diabetes. Respiratory difficulty of the "air hunger" type, drowsiness passing into coma, thirst, acetone in the breath and a urine composition identical with that of diabetes mellitus save in the absence of sugar, are all found in recurrent vomiting. In pursuance of this theory he treats with large doses of bicarbonate of soda, and has seemed able in some cases to avoid or cut short the attacks. But on the other hand, many cases have failed to yield to this treatment, and, as Langmead points out, the constituents of the urine on which Edsall places dependence are so frequently found unassociated with vomiting as to lessen their value in his theory. There is little doubt that acid intoxication occurs, but that it occasions the vomiting is yet to be demonstrated. And when improvement has followed the administration of the bicarbonate of soda it is only by the *post hoc ergo propter hoc* argument that we can assert that it is due to correction of the acid poisoning.

Other measures that have been employed more or less empirically are starvation for twenty-four hours, rectal feeding, limiting of mouth feeding to barley water and broth, rectal lavage, magnesia, normal saline per rectum or subcutaneously, and occasionally morphine combined with atropine. One cannot escape the impression, however, that most practitioners adopt these various measures largely from a desire to "do something," and that the avowal of some of them that "nothing stops it" sums up the general experience.

The matter is treated at some length by Shaw, Tribe and Langmead in the *British Medical Journal* for February 18, 1905, and the authors make it perfectly evident that there is plenty of room left for study and discovery in regard to the etiology and treatment of this disorder.

ABSTRACTS

Recent Experiences with Catarrhal Jaundice.—H. N. Chapman (St. Louis Medical Review, Feb. 4, 1905), reported five or six cases of catarrhal jaundice in children which have presented themselves to his attention during the past few months. The age range has been from three to ten years. The symptomatology has been fairly uniform in all the cases. Subjective symptoms consisted of anorexia, almost complete, abdominal distress not distinctly localized, languor and lassitude. Objectively we find, the skin discoloration of an exquisite yellow hue, as is also that of the conjunctiva and mucous membranes; putty-colored pasty stools, and constipation. Diarrhea may be an accompaniment though not a reasonable one, and if it exists there is an enteritis added to the gastro-duodenitis. Vomiting is usually though not invariably present; high colored urine, bilirubin being present in large quantities. Mucus, saliva, and tears do not show the presence of the coloring matter of bile; there is depression of spirits. Much gas is formed in the bowels, because of imperfect intestinal digestion, due to the absence of bile. If there is any enlargement of the liver, it is difficult to detect; there is tenderness in the right hypochondriac and epigastric regions. The child is usually not very ill and is brought to the physician because the parents became afraid of the bad color. The etiology is not very clear. An epidemic has been reported. It may complicate or follow any of the contagious diseases, as well as influenza or malaria. Probably the usual starting point of the trouble is some article of diet not well digested, setting up some gastroduodenitis, which spreads by continuity to the bile ducts, obstruction being caused, with consequent resorption of bile into the lymph vessels, and thence being poured into the blood, from which source the tissue staining takes place. One of my cases was caused in this manner: A little fellow, five years old, was given two glasses of cold milk, which he drank greedily; this was during the afternoon. After going to bed he was taken very sick at his stomach and vomited the milk in large curds. After thoroughly emptying his stomach he was relieved and slept till morning. About two days later he had become quite yellow, showing the classical symptoms of catarrhal jaundice, from which he recovered within a week or ten days. A study of the symptomatology of catarrhal jaundice in the human family may throw light on the causes of much of the unhappiness of the race, and probably account for not a few suicides. As some one well remarked, "No one ever died a triumphant death with a disease below the diaphragm"; and the melancholy and depression of spirits that result from this disease are no doubt accountable for much of our unhappiness. The prognosis is invariably good. Death does not follow from simple uncomplicated catarrhal jaundice. The treatment is simple. Regulation of diet, interdiction of fats and starches. Fruit and broths and lean meat and toast may be taken in moderation; water freely. Calomel and salol constitute probably the best drug treatment, with saline purgatives to relieve constipation and clear out the intestinal canal.

Primary Pneumococcic Appendicitis with Pneumococcic Peritonitis.—L. SHAW, M.D., F.R.C.P. (Brit. Med. Journ., July 2, p. 18). A girl, aged eighteen, was admitted to Guy's Hospital on April 5, 1904. On the night of April 3, while in good health, she was seized with violent pain all over the abdomen, so severe as to "double her up." Early on the morning of April 4 she vomited; between then and admission she vomited several times and the severe abdominal pain continued. There was frequent diarrhea, but whether this was the result of purgation, or a symptom of the disease, could not be ascertained.

She was too collapsed to allow of complete examination. The pulse was 120, almost imperceptible; the respirations were 24, and thoracic. The temperature was 102 degrees. There was little abdominal tenderness or rigidity. There was evidently extreme prostration from a very acute abdominal lesion. She was too ill to operate upon and died a few hours after admission.

Necropsy.—There was acute general peritonitis, with thick buttery lymph, and about one pint of pale turbid fluid in the peritoneal cavity. The lymph was thickest in the region of the cæcum and appendix. The appendix was swollen, reddened, turgid, and buried in lymph; there were no adhesions or perforation.

Two Cases of Infectious Splenic Anemia in Childhood in a Family.—DR. PITINI (Gazetta Medica Lombarda, March 28, p. 120). A boy, aged three, came under observation. His sister, aged four, died three years before from anemia, accompanied by enlargement of the liver and spleen. The boy had measles a year before and then began to grow thin and had interrupted fever, which was higher in the evening. The abdomen swelled on the left side and the feet and face were often edematous. He was very lean and pale. The glands were not enlarged. The gums were swollen and easily bled; the internal surface of the left cheek, opposite the last molar teeth, showed a circular ulcer. The liver was enlarged; the spleen was swollen, hard, and indolent. Blood examination showed 38 per cent. of hemoglobin, 2,225,000 red and 10,500 white blood cells. A virulent diplococcus was isolated from the blood.

Case II.—His brother, aged eight months, had always been very thin and pale. There were no swollen glands. The liver and spleen were enlarged. Blood examination gave 40 per cent. hemoglobin, 2,500,000 red, and 8,000 white blood cells.

In both cases the fever ranged from 100.4 degrees to 101.4 degrees in the morning to 102.2 degrees to 103.1 degrees in the evening. The history excluded syphilis; the blood examination, malaria, leukemia, and pernicious anemia. The only diagnosis was therefore splenic anemia. The first child was in a desperate condition. Iron and arsenical treatment proved nearly useless. The second one died from relapsing gastroenteritis.

Spastic Diplegia During Pertussis.—J. H. W. Rhein, Philadelphia (Journal A. M. A., March 4), reports the case of a child, thirty months old, who had spastic diplegia in the legs with nystagmus. Later a similar condition of the arms gradually developed, with difficulty in swallowing, etc. The child became greatly emaciated, and finally died after numerous general convulsive attacks, worse on the right side. The autopsy revealed numerous small hemorrhages in the right and left frontal cortex, slight thickening of pia in the paracentral region, with a few small cortical hemorrhages. There were areas of distended perivascular spaces containing many round mononuclear cells, which were also distributed everywhere throughout the cortex; their protoplasm was granular. In the occipital region there was thickening of the pia and intense red blood cell infiltration. Microscopically, marked degeneration was observed in one cerebral peduncle. The general appearance was that of the hemorrhagic meningo encephalitis. Rhein believes that the widespread lesion of the cortex was due to a toxin acting on the vessels and setting up an inflammatory process. This caused local destruction of fibers, especially in the paracentral region, followed by degeneration in the pyramidal tracts. The minute cortical hemorrhages he attributes to the convulsive attacks preceding death.

Ophthalmia Neonatorum.—E. Jackson, Denver (Journal A. M. A., March 11), holds that rigid cleanliness, while it will greatly diminish the number of cases of blindness from this cause, will not always prevent it, and that the Credé method, while efficient, sometimes causes irritation. He sees some hope in the use of some of the less irritant silver salts than the nitrate, but believes that we need more experience in their use before we can give them the same confidence. Even in case of actual purulent disease, careful treatment will usually prevent blindness. He thinks that social conditions favoring or opposing the spread of gonorrhea are more important than legislative measures aimed directly at purulent conjunctivitis, and that gonorrhea is a malignant contagious disease and should be publicly recognized and dealt with as such in all its clinical manifestations.

Acute Meningitis.—W. T. COUNCILMAN, Boston (Journal A. M. A., Apr. 1). The author describes the conditions of acute meningitis with more special reference to that form produced by the *Diplococcus intracellularis meningitidis,* which he believes is constantly occurring in a sporadic form, aside from the not infrequent epidemic aggravations. The infecting organism, he states, is one of low vitality and incapable of a purely saprophytic existence. The statistics fail to give any adequate idea of the frequency of the infection in ordinary years. His experience, however, leads him to believe that with rare exceptions all cases of primary meningitis are due to this micro-organism, and that it would be impossible without sporadic infections to bridge over the intervals between the epidemics. It is possible, too, that the germs may even inhabit the normal mucous membranes, of the nose, for example, as has been shown in a few cases, where it produces a rhinitis, and infection of the meninges may take place through the lymphatics or by continuity of surface. We can only explain the epidemics of the disease, he says, either by an increase of virulence of the diplococcus or by a decrease in the resistance of the tissues. The underlying causes of epidemics are unknown, and even atmospheric conditions can not be excluded. He discusses to some extent the relations of meningitis to pneumonia, as shown by the Massachusetts health statistics, and illustrates with a chart. Primary meningitis from the pneumococcus or staphylococcus is rare; secondary types are not so infrequent. The paper concludes with a description of the pathologic condition in acute meningeal disease.

Laryngeal Papillomata in a Child.—L. D. BROSE, Evansville Ind. (Journal A. M. A., Mar —). The author reports the successful removal of papillomatous laryngeal growths from two children, aged 11 years and 19 months, respectively, The diagnosis of these conditions is easy if laryngoscopic view is possible. Otherwise the vocal and respiratory disturbances, aphonia or altered voice, difficulty of breathing, especially during sleep, etc., will have to be relied on. If the patient is old enough to co-operate with the physician and an endolaryngeal operation is possible, life can generally be saved and the voice restored, but recurrence is to be expected in 25 to 50 per cent. of the cases. When an endolaryngeal operation can not be successfully done the only recourse is in external laryngotomy, preferably after tracheotomy. Thyrotomy in a child is tedious and difficult, and the mortality is high when done for papilloma.

Hairlip and Cleft Palate.—G. V. I. Brown, Milwaukee (Journal A. M. A., Mar. 18), after a classification and description of the varieties of these defects, condemns the radical operation in the young infant on account of the high death rate, the danger of meningitis, the unsatisfactory cosmetic results at that age, the risk of too great approximation of the turbinates, occluding the nasal passage and producing mouth breathing, etc. If conditions are favorable he would use adjusted strips to prevent the action of the lower jaw from forcing the maxillary bones apart and to cause an opposite effect when the child laughs or cries. Of course, the child should be mouth fed; the sucking habit should be overcome. The proper age is after the full eruption of the deciduous teeth and before the speech habit has been fully acquired. He would then use a screw appliance, which is illustrated, to approximate the bones and would also use proper treatment for the diseased oral surfaces. In young patients this will probably be sufficient, in older patients some crushing operation may be required. It is most desirable to bring the anterior portions into direct contact so as to allow freshening, not only of the soft borders, but the bony tissues as well, thus securing complete circulation to nourish the flaps when the final muco-periosteal operation is performed. He emphasizes the importance of having needles selected with curves suiting each part of the operation. The fuller details of the technic of his method are left for a future article. The importance of the after-treatment is especially dwelt on, and he particularly mentions singing as one of the best practical aids to speech improvement. The patients are often neurotic, and the complicating neuroses must be considered in the treatment. With his method he thinks the restoration of the palate in its nearly perfect form can be obtained. The difficulties of oral asepsis are noticed, and he says his post-operative sheet anchor for the mechanical cleansing of the parts is dioxogen, which, with a 2½ per cent. of carbolic acid solution, should be used alternately each hour during the day, and at least four times at night. For this he uses a hospital syringe and injects with force enough to dislodge little particles of débris, but not enough to do injury. Wiping with cotton wool applicators is required also three or four times a day, and nebulizing some of the oil preparations are used as supplementary after the washings throughout the course of treatment. The article is elaborately illustrated.

The Influence of Red Light on Vaccination. (Impfreaktion unter Rothlicht.)—Roesler (Wiener klinische Wochenschrift, No. 47, 1904). Goldmann recently reported his experience in vaccinating forty children in a photographic dark room and afterwards bandaging in red. In these cases he found no inflammatory action which was present in the control cases. Other investigators have obtained like results. In Goldmann's cases, those vaccinated under red light and the red bandages removed a few days later, ran the ordinary course, as did those vaccinated under the red light and not bandaged. In those cases, however, where the red bandage was retained until after the pustular stage, he found the modified course.

The author vaccinated five hundred men in the day-light, and after the lymph died applied the bandages. One-half of these men were bandaged with red gauze covered with red gelatin wrapped in red gauze. The other half were not bandaged. On the eighth and ninth day a distinct difference was noticed in the two groups. Among the red bandaged cases only six vaccinations were negative, while twenty-two were negative among the others. The pustules dried more quickly and had only a small inflammatory area. The auxillary glands were not enlarged or tender in any of these cases. The pustules did not become confluent and were much smaller and the scar was small, deep and typical. The author believes that his investigations show that the red light exerts a favorable influence over the course of vaccination and that its influence is not exerted on the lymph itself at the time of inoculation, but at the time the organism is infected.

On the principle that the red light limits suppuration, the author treated some cases of wounds from horse bites, which invariably suppurated. Under the red light treatment the swelling and redness were lessened and the wounds were decidedly smaller and covered with only a slight amount of pus.

Clinical Study of Ninety-seven Cases of Summer Diarrhea in which the Intestinal Contents were examined for Dysentery Bacilli.—May Michael (Woman's Medical Journal, Mar,, 1905). This report contains a synopsis of the clinical features of the cases of summer diarrhea studied bacteriologically by Dr. Weaver and his associates. The records were made at the Daily News Sanitarium by Dr. Bethene Coone. Dr. Vail, and the author. The character of this sanitarium, which is more of a temporary refuge than a place for permanent treatment and care, explains the incompleteness of some of these observations.

SYNOPSIS OF THE NINETY-SEVEN CASES STUDIED.

Age and sex.—Of the 97 cases of summer diarrhea examined for dysentery bacilli, 60 were males and 37 females. Sixteen cases were in patients less than six months of age, and of these, four were severe, six moderately severe, six mild. Of 36 cases in patients between six months and one year, 14 were severe, 11 moderately severe, 11 mild. Of 40 cases in patients between one and two years, six were severe, 18 moderately severe, three mild. Consequently, the majority of cases occurred between one and two years. It seemed that cases occurring between six months and one year were most severe.

Method of feeding.—Only nine of the children were breast-fed at the time of the attack; 16 others were partly breast-fed. Of these 16, two received, in addition to the breast, condensed milk, 12 mixed diet, one laboratory milk, one Mellin's food. Of the 66 artificially fed children, 43 had general diet, 10 milk or modified milk, eight condensed milk, two Eskay's food, one oatmeal gruel. Hence, the largest number of cases occurred in artificially fed infants.

Predisposing causes.—In only 24 cases did the attack seem to depend upon special conditions; in three cases it followed weaning, in two change of diet, in 19 the feeding had been manifestly improper.

Principal symptoms—In 45 cases the stools contained mucus and blood; in 28 only mucus; in 23 neither mucus nor blood; in one case there is no record.

The number of stools varied from two to thirty in 24 hours. In about half of the cases there were from two to ten stools in 24 hours.

Tenesmus occurred in 23, vomiting in 52, persistent vomiting in seven.

Complications.—Eczema in two, furunculosis in three, bronchitis in 16, pneumonia in two, stomatitis in seven, prolapse of rectum in five, convulsions in three. In 28 cases there was evidence of rickets; all except eight were or had been breast-fed; in 10 of these cases the attack was severe, in 12 moderately severe, in six mild.

Termination.—Three died, 54 improved, 11 remained stationary, and of 29 there was no final record left at the sanitarium.

These 97 cases may fairly well be divided into two groups: (1) Cases of gastro-intestinal catarrh, or fermental diarrhea, in which the toxic symptoms predominated; (2) Cases of follicular enteritis, ileocolitis or colitis, in which the inflammatory symptoms predominated.

Cases of the first group were characterized by sudden onset, loss of appetite, vomiting, and diarrhea. The fever ranged from 99 degrees to 101 degrees in mild cases, and rose to 104-5 degrees in the severe ones. The stools numbered from six to ten a day, were yellow or green and slimy, thin and watery, or brown and offensive; they often contained undigested food and mucus. The child was restless, with dry mouth and coated tongue. Sometimes, if the toxemia was great, convulsions occurred at the onset and the disease ran a severe course with continued high fever and marked nervous symptoms.

Complications were not common, but at times, eczema, furunculosis, stomatitis, whooping-cough, bronchitis, and pneumonia occurred. Recovery within five to six days was the general termination, although the disease occasionally became chronic and lasted for weeks.

In the second group the inflammatory symptoms were more marked. The onset was acute, the attacks being ushered in by diarrhea, often accompanied by vomiting; the stools, at first fecal, soon consisted almost entirely of mucus or mucus and blood, this last element varying from a few flecks to a large amount. The temperature was, as a rule, but slightly elevated, 100-1 degrees, although at times normal or subnormal, and sometimes at the beginning very high. Tenesmus was usually present and often associated with prolapse of the rectum. Abdominal pain was frequent and quite intense just before stool. These cases ran a variable course from one to six weeks, but recovery was the rule.

SYNOPSIS OF TWENTY-FOUR CASES OF SUMMER DIARRHEA FROM THE STOOLS OF WHICH DYSENTERY BACILLI WERE ISOLATED.

Age.—Under six months, one; between six and twelve months, two; between one and two years, 15.

Method of feeding.—Breast-fed, three; partly breast-fed, three; artificially fed, 12 (eight, general diet; two, cow's milk; two, condensed milk); no record, six.

Principal symptoms.—In 22 cases the stools contained mucus and blood, in two only mucus. Tenesmus occurred in 11 cases and vomiting in 13; rectal prolapse in two; bronchitis in four.

Termination.—Recovered or improved, ten; unimproved, five; died, two; no final record, seven.

Hence, cases associated with dysentery bacilli in the stools presented more the clinical picture of ileo-colitis.

The question whether infection from B. dysenteriae causes a clinical entity has been discussed by a number of writers. Dorothy Reed[1] has studied a series of cases in which B. dysenteriae was isolated from the stools and has drawn the following conclusion: "Blood and mucus or much mucus in the stools, where there is no occasion for such an appearance, as intussusception, extreme purgation, etc., indicates infection with the B. dysenteriae; even a little mucus points to such an infection if such stools have existed for a long time. A certain number of cases of infantile diarrhea present a symptom complex comparable to adult dysentery and are caused by the B dysenteriae."

Knox[2] says that among children, diarrheas due to B. dysenteriae cannot be differentiated from the ordinary summer diarrheas.

Hastings[3] has found the Shiga bacillus in cases diagnosed clinically as follows: Ileo-colitis, 25; cholera infantum, one; entero-colitis, two; fermental diarrhea, one; gastro-enteritis, two; enteritis, four.

La Fetra and Howland[4] believe that all types of diarrheal disease as characterized by their clinical symptoms are to be found among these cases (62 cases in which the Shiga bacillus was found); some of these were examples of severe and some of mild ilocolitis; others could be classed as only the mildest form of intestinal indigestion.

Holt[5], drawing his conclusion from all the cases studied by the Rockefeller Institute, says: "Infection with the dysentery bacillus is associated with almost every sort of intestinal disturbance accompanied by diarrhea, except the severe acute intestinal intoxication, cholera infantum. The B. dysenteriae is associated with inflammatory forms of diarrhea of all degrees of severity, mildest, most severe, acute, protracted, subacute; occurring both as a primary disease and a secondary disease, often occurring in institutions as a terminal infection in infants suffering from marasmus."

Rotch[6], from the study of a series of cases, concludes: (1) That there are no specific symptoms besides the presence of B. dysenteriae in the discharge to determine that B. dysenteriae is the cause of an especial case of ileo-colitis; (2) that B. dysenteriae may cause the clinical type known as fermental diarrhea or as ileo-colitis.

Koplik[7], in discussing the question, says the bacillary diarrheas occur for the most part in older children, although they may occur in very young children, and have been found in intitutions or in certain localities. They are a distinctly limited class of diarrheas, and do not include all the forms which are gradually being controlled by modern methods of infant feeding.

Duval and Bassett[8] state that summer diarrheas are caused by intestinal infection with B. dysenteriae Shiga, and are therefore etiologically identified with acute bacilliary dysentery of adults. These cases from which the dysentery bacillus was isolated include examples of so-called dyspeptic diarrhea, entero-colitis, malnutrition, and marasmus with superimposed infection.

Clinically the 24 of our 97 cases in which dysentery bacilli were found did not differ from the cases of ileo-colitis in which the dysentery bacilli were not found.

The success which has been attained in Japan with the specific serum treatment of dysentery in adults encouraged its use in infantile dysentery. Acording to Shiga the mortality in adult dysentery by its use was reduced to one-third below that given by the symptomatic treatment. On the whole, however, the results in infantile dysentery are disappointing. Only 12 of the 87 cases reported by the Rockefeller Institute showed any improvement attributable to its use. Holt[9] says the conditions for success in the use of the serum are, first that it must be used early before serious lesions have developed, and second, that it must be used in repeated doses (10 c.c. daily in moderate cases, repeated two or three times daily for several days in severe ones). He believes that the promising cases are the sharp acute attacks with symptoms of severe infection, where the real problem is to combat the infection, not to maintain the nutrition; also that, inasmuch as two days are required for bacteriological diagnosis, is used at all, the serum must be injected on a clinical diagnosis. The variety of serum usually used is that obtained by immunizing animals with both the "Harris-Flexner" and the "Shiga" types of bacilli. The serum was used in only two of our series of cases; neither showed marked improvement from its use. As Holt says, a more extended trial upon more carefully selected cases is necessary before definite statement can be made as to the value of anti-dysenteric serum.

CONCLUSION.

I. Dysentery bacilli were not found in all cases characterized by mucus and bloody stools.

II. The group of cases in which dysentery bacilli were isolated from the stools presented the clinical picture of ileo-colitis.

III. Cases of ileo-colitis in which dysentery bacilli were isolated from the stools did not differ clinically from the cases of ileo-colitis in which these bacilli were not found.—Journal of Infectious Diseases, January 12, 1905.

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[1] Studies from Rockefeller Institute for Medical Research, 1904, 2, p. 175.

[2] Jour. Am. Med. Assn., 1903, 41, p. 173.

[3] Ibid., 1904, 12, p. 1121.

[4] Studies from Rockefeller Institute of Medical Research, 1904, 11, p. 173.

[5] Ibid., p. 185.

[6] N. Y. State Jour. of Med., 1904, 4, p. 173.

[7] Archives of Pediatrics, 1903, 20, p. 808.

[8] Studies from Rockefeller Institute for Medical Research, 1904, 2, p. 7.

[9] Loc. cit.

Indications for Removing the Faucial Tonsils.—Adolph O. Pfingst (American Practitioner and News). The question of the advisibility of removing the faucial tonsils is not always an easy one to decide. It is true that even though no benefits may be derived, in some instances, from the removal at least no harm can result, a fact, however, which in no way justifies an indiscriminate removal of tonsils which may perhaps be somewhat enlarged. A careful study of the individual case should be made and a conservative stand taken, the operation being suggested only after we are convinced that the presence of the tonsils is a detriment to the welfare of the patient.

The most obvious indication for the removal of the tonsils is an excessive enlargement or hypertrophy causing encroachment upon the faucial space and interfering with deglutition, respiration or phonation. Even when not excessively large, we are justified in treating tonsils surgically when by their presence they cause pressure upon eustachian tube and secondary interference with the function of hearing. Tonsils subject to recurrent attacks of cryptous inflammation at intervals frequent enough to retard the development of the child are also best dealt with surgically. Another indication for taking out the tonsils is the presence of a chronic superficial pharynigitis or tonsillitis where the tonsillar inflammation seems to keep up the pharyngeal and frequently a laryngeal irritation. This is particularly true in actors, speakers or singers, whose voices give out easily as a result of the chronic affection.

With any of these conditions existing the only factor which could be considered as a contra-indication to tonsillar abscission is a hemorrhagic diathesis or hemophilia on the part of the patient. It is held by some that removal of the tonsils is followed by a slight elevation of the pitch of the voice, and an erroneous idea exists among the laity that the voice is forever ruined by taking out the tonsils. Granting that the pitch is occasionally slightly raised after the operation, this could be a consideration only with the alto or bass singers, while the tenor and soprano could only look with favor upon something that would elevate the pitch of their voices.

After the removal of the tonsils has been decided on, the question to be considered is whether the so-called tonsillectomy, the radical removal of the tonsillar tissue, is necessary, or whether the removal of a portion of it (tonsillotomy) will suffice. Tonsillectomy is the modern surgical operation of the throat, and is being largely practiced in this country. It is employed principally in cases of recurrent tonsillar or peritonsillar inflammation where, to prevent recurrence, it is advisable to remove as nearly as possible all of the adenoid tissue between the faucial pillars. This radical measure is also recommended in cases where the cervical lymphatic glands are enlarged with the hope of preventing other infection, or with a view of preventing recurrent cervical adenitis. To remove the adenoid tissue between the pillars of the fauces, the so-called submerged portion, curved scissors, tonsillar punches, curette, electro-cautery, and various other devices, have been employed.

The more common operation, that of abscising the protruding portion, is best performed by means of a tonsillotome. There are many instruments of this kind on the market, although the instrument of Mathieu has met with most favor, and is undoubtedly the most serviceable. It has the advantage of having the long diameter of the guillotine vertically when in position, and its narrow frame takes up but little room in the throat. If the object of the surgical procedure is merely to increase the size of the faucial space, and thereby aid in deglutition, respiration and phonation, a tonsillotomy with the tonsillotome is all that is required. The hot and the cold snare, or forceps and bistoury, have been used to remove the protruding portion of the tonsils, though much less frequently than the guillotine. The latter has the advantage, especially in children, of being easily and rapidly applied, and of causing less fear to the patient than an exposed knife. It has the advantage over the cold and electric snares that, with it the operation is less painful, and more rapid of execution. The instrument can be used as a tongue depressor and can rapidly be slipped over the tonsil while the child is retching, and the organ removed almost before the patient is aware that anything is being done.

With beginners, probably the most frequent cause of failure to remove as much of the mass as desired is a failure to get the under portion of the ring of the instrument well below the tonsil before applying the upper portion. The lower end of the tonsil is often pendulent, and when this overhanging portion is well hooked into the ring of the instrument the rest of the mass easily slips in by making slight pressure upon the instrument. Another common cause of failure to do a good tonsillotomy is that the adhesions of the faucial pillars to the tonsils are overlooked. This condition is quite common in subjects who have had frequent recurrent attacks of tonsillar inflammation. The pillars should be well separated with a blunt hook or a bent knife before using the guillotine.

In adults or manageable children the operation of abscission of the tonsils can be done without an anesthetic with the patient in the sitting position and with reflected light. In unmanageable children, I used nitrous oxide gas, preferring this to chloroform or ether, as it allows the operator to keep the patient in the upright or natural position. I have used chloroform for the performance of this operation, but my chief objection to it is that the work has to be done in the recumbent position, and that the throat fills up with blood as soon as the first tonsil is abscised, so that in the removal of the second one the instrument has to be guided by the sense of touch rather than sight. I frequently have the child held by an assistant, and with the mouth held open by means of a gag, remove the masses without an anesthetic, as I believe that the operation is not very painful. In such cases the assistant must be well instructed before beginning the operation. With the child on the left knee the right leg of the assistant is crossed over the left, the legs of the child being held firmly between the two. The right hand of the assistant is passed across the child's chest to grasp the left arm, which, at the same time, pinions the right arm to the body of the child. The head is held with the left hand, which can also keep the gag in position. It has been my custom to depress the tongue with a tongue-depressor in the left hand, then to apply the tonsillotome; at the same time making pressure on the side of the neck with the left hand, from which the tongue-depressor has in the meanwhile been dropped. This external pressure makes more of the tonsil engage in the instrument, and consequently allows you to get the tonsil out closer to its base. I rapidly reverse the instrument for the second tonsil, usually without giving the patient opportunity to expectorate. As I find the left tonsil somewhat more difficult to get at than the other, I always remove the left one first.

The dangers of the tonsillotomy are very slight, although alarming and sometimes fatal hemorrhage may follow the operation. As adults are more apt to bleed than children, I believe that we should not remove both tonsils at one sitting in the adult. Bearing upon this, I quote from Bosworth, who says, "I never undertake the operation in adults without apprehension, and without being prepared for emergencies." The bleeding after a tonsillar operation may be profuse, occurring immediately after the operation, and causing the patient to retch and cough and usually to become very much frightened. Children, during such a hemorrhage, frequently swallow considerable of the blood, which may subsequently be vomited. Hemorrhage may also be of an oozing nature—parenchymatous. This form of hemorrhage usually begins several hours after the operation, or even after one or two days. Fatal cases of post-operative hemorrhage are said to be extremely rare, especially in children. Personally, I have had no fatality, but in one case the bleeding perisisted rather profusely—long enough to become alarming. This was in a rather full-blooded girl. I might, incidentally, say that she was menstruating at the time, and as I have seen persistent tonsillar hemorrhage after operation upon another occasion in a girl who was menstruating, the possibility of a connection between the two naturally suggests itself.

The most common causes of tonsillar hemorrhage are (1) a hemorrhage diathesis (hemophilia), or other diseased conditions of the blood in which the power of coagulation is below par; (2) a fibrous condition of the tonsils which is seen as a result of frequent inflammation of the tonsil and which prevents contraction of the arterioles, and (3) abnormalities in the distribution of the blood vessels of the tonsils.

In deciding upon the management of alarming hemorrhage of the tonsils it is important, if possible, to inspect the bleeding surface with the view of determining whether the hemorrhage is taking place from a single vessel or whether there is a general oozing from the cut surface. In the former, an attempt should be made to grasp the bleeding vessel with a hemostat and arrest the hemorrhage by torsion. Failing in this, direct mechanical pressure should be resorted to, either with the finger or by means of special tonsillar hemostat. As a last resort, ligation of the common carotid has been recommended. Styptics, such as the iron salts, tannic or gallic acid, adrenalin, or hot and cold water, are of little or no use in this kind of hemorrhage. They may be of some service in cases of incontrollable parenchymatous bleeding, but even in these it may become necessary finally to resort to mechanical pressure or cauterization of the bleeding surface to arrest the flow of blood.

In excitable individuals, I believe that small doses of morphia are indicated to quiet the patient. It is said that nearly all cases cease bleeding spontaneously when the patient, becoming weakened by the loss of blood. enters into a state of syncope.

Pain, after a tonsillar operation, is very slight in children, and usually also in adults, unless the pillars of the fauces have been wounded during the operation. An exudation forms in several days, covering the cut surface and furnishes a protection to the underlying structures. No especial after treatment is called for.

Malignant Endocarditis Followed by Convalescence.—G. Newton Pitt, M.D. (Lancet, Nov. 12, p. 1349).

Case I.—A boy, aged 13, developed chorea on May 13, 1903. A week later an apical bruit was detected, and later there was albumin in the urine, while headache and vomiting developed. An extensor plantar reflex on the right side was then noticed. The bruit became louder, rigors developed, and a large amount of albumin was found in the urine. Six days after the extensor plantar reflex was noticed there was right hemiplegia with complete aphasia and incontinence of urine. The boy became extremely drowsy and much emaciated. The general condition during June and July deteriorated, so that death seemed almost certain. He was extremely anemic, but improved rapidly when injections of anti-streptococcic serum were given on alternate days for six weeks. The boy recovered in the most remarkable manner. Speech returned with power in the right side, and he gradually regained his strength, being in October the picture of health.

Case II.—A boy, aged 11, was admitted to hospital with a right apical pneumonia, which cleared up in five days. A fortnight later the temperature was slightly raised, and a systolic blowing bruit developed in the left fifth space. It gradually became louder and the temperature oscillated up to 100° F. for a month, when it became normal. Injections of Pané's antipneumococcic serum were given, and he left the hospital in perfect health and remained so when last heard of. Some months later the bruit was still audible.

That cases of malignant endocarditis may run a course of some months is well known, but comparatively few cases are recorded in which the patients regained health. In both these cases the boys enjoy perfect health, although the valves were permanently damaged. The beneficial effects of the antistreptococcic serum were very striking, and recovery was certainly due to its use.

The Cardiac Complications of Diphtheria.—F. W. White, M.D., and H. M. Smith, M.D. (Boston Med. and Surg. Jour., Nov. 12, p. 433) have analyzed 1,000 cases of diphtheria treated in the Boston City Hospital in which the condition of the heart was particularly observed. Their results show a much higher proportion of murmurs (94 per cent.) than has been found by others. The patients were principally children. All the murmurs were systolic except those in a few cases of chronic heart disease. They were loud and sometimes musical. They were usually heard at the apex, frequently transmitted to the axilla, and generally associated with accentuation of the pulmonic second sound. The majority were associated with irregular action of the heart and outlasted the fever. It was therefore concluded that they were not functional. They developed in the first few days of the illness and they lasted several weeks at least. Five of the six patients were examined eight or ten months after leaving hospital. All had murmurs, and two had cardiac enlargement and irregularity with a weak first sound, indicating probably chronic myocarditis. In about 35 per cent. of the cases the heart was irregular at the time of discharge. Pathological researches have shown that such murmurs are due to mitral insufficiency from changes in the heart muscle of its innervation. Endocarditis and pericarditis are very rare complications of diphtheria. Cardiac enlargement was frequently found, contrasting with the observations of Dr. D. B. Lees. The writers also do not confirm his views as to the frequency and importance of acute cardiac dilatation and syncope. In almost all the fatal cases there was gradual cardiac failure.

There were three types of cases. In the first and most serious there were gallop rhythm, vomiting, epigastric pain and tenderness, and the majority were fatal in two or three weeks. The second type lasted weeks or months, with a rapid regular or irregular heart, which gradually became normal. The third type was very rare. Its main feature was a slow pulse at the end of the second or the beginning of the third week. There were three cases of this type, which were all fatal.

Treatment.—Prolonged rest in bed was ordered in all severe cases, but all the patients who had murmurs and a somewhat irregular pulse increased in rate were not kept in bed. Digitalis and alcohol rarely did any good. Strychnia was found to be the best drug, and was given in doses of 1-60 gr. every four hours to a child aged from 5 to 10. In many cases larger doses seemed to be useful.

Relation of the Index of Alkalinity to the Production of Diphtheria Toxin.—A. P. Hitchens, Glenolden, Pa. (Science, March 31, 1905). A study of the reaction of bouillon before and after sterilization shows that in media containing carbohydrate the rise in acidity after sterilization varies according to the temperature of the sterilizer. This is most important in the production of diphtheria toxin. Bouillon prepared according to the method of Smith, and sterilized in the autoclave, showed after sterilization varying indices of alkalinity. The reaction after sterilization of sugar-free bouillon is very uniform. And as the reaction of bouillon for the production of diphtheria toxin must be very exact, it is advantageous to add the dextrose after sterilization. The meat juice is neutralized to litmus, planted with the colon bacillus and incubated over night to destroy the muscle sugar. The bouillon is made from this in the ordinary way, two per cent. of Witte's peptone being added. It is dispensed into Fernbach flasks, one liter in each, and sterilized in the autoclave. Little attention need be paid to the temperature, it may vary anywhere from 115° to 120°, 0.2 per cent. of dextrose is added after sterilization. The cultures are incubated six days at 35°-36° C. The reaction of the bouillon before sterilization is made +.45, so that after sterilization it may be +.75. Toxin made by this method has been very uniform, rarely being below .005 c.c. for a 250-gram guinea-pig.

The Viability of B. Dysenterioe Shiga.—W. D. Frost and R. Whitman, University of Wisconsin in **Science**, March 31, 1905:—Four strains of this organism were tested. One was the Shiga type. The others belonged to the Flexner-Harris type. Of these one was the Harris culture and the others were from Duval and Bassett's series of summer diarrhoea cases. The viability was tested by drying the organisms on articles of merchandise, dried food substances and in sterile distilled water and milk, under various conditions. A summary of the conclusions reached follows: the B. dysenterioe when dried on articles of merchandise, as paper, cloth and wood dries rapidly in from four to nine days at the temperature of 17-20° C. On dried food substances, as bread, rice and albumin balls, this germ may live for days. In some cases it is able to live over a month. In sterile water the life of the germ is very short, rarely maintaining itself more than a week. In sterile milk the germ can live until the medium is dried up. The different strains vary in their viability under given conditions, the Shiga type culture being distinctly more frail than cultures of the Flexner-Harris type, the effect of temperature in modifying the viability of the germ being important. At a temperature of 38° C. it will live from only one half to one fourth of the time that it will live at a temperature of 17-20° C.

Treatment of Gastro-enteritis with Buttermilk.—During a severe epidemic of gastro-enteritis and of cholera-infantum in the north of France, buttermilk was largely employed as a medicament. The conclusions which have been drawn by Dr. Floquet from the results of his experiences are reported by E. Decherf (Arch. de Med. des. Enfants, January, 1905) as follows: Buttermilk is generally well taken by infants, who prefer it to sweetened boiled water. Its use was followed by good results, while in parallel cases, treated by other means, no improvement was observed, while acting in these cases as a specific, buttermilk is also a food and causes an increase in weight. It is indicated in both chronic and acute cases. It produces excellent results in rickets; it combats the intestinal fermentations which give rise to chronic auto-infection. Some practitioners have administered the buttermilk raw, but the majority who have used it prefer to give it boiled. The following is the method of preparing the buttermilk: One tablespoonful of farina to a liter of buttermilk, which is then slowly boiled in an enamelled or porcelain vessel, at the same time that it is constantly stirred. The mixture is kept boiling for several minutes, at the end of which 75 grams of sugar are added. It is then ready to be fed to the infant, either in the bottle or with a spoon or cup. In cases of acute or chronic gastro-enteritis, it is given in the same doses as milk, every three hours. In the beginning it is best to give it in fractional doses of a tablespoonful every fifteen minutes. Although during the first few days the child may vomit after taking the buttermilk, the stomach soon gets used to its acid food. In children over a year old, sometimes large doses are necessary. The good effects of buttermilk are to be attributed to the large amount of lactic acid present, which counteracts intestinal fermentation. The small amount of fat contained, and the fine division of the casein, thanks to churning, render the preparation very digestible.

Associative Action of Bacteria on the Souring of Milk.—C. E. Marshall, Michigan Agricultural College (Science, March 31, 1905. The author, working with cultures of associated bacteria, consisting of B. acidi lactici, and a bacillus obtained from milk and not yet described, possessing marked proteolytic action in its growth upon milk, and producing alkaline reaction, decidedly marked in old cultures, has been able to demonstrate that loppering is hastened by the presence of this proteolytic germ over that of the lactic acid germ, by as many as ninety-six hours at times, temperature 20° C.; that the acidity rises high above that of the lactic germ; that these changes may be noted by the naked eye appearances of the cultures; and, further, that the lactic acid germ develops much more rapidly when associated with these proteolytic germs than when existing in pure cultures. He has also found that the products produced by the proteolytic germ are stable and that they may exert the same influence as the presence of the living germ. Analyses of cultures at various ages indicate that the products influencing the growth of the lactic acid germ are either amido or ammonia compounds. Synthetic cultural media have been attempted, but without satisfactory results so far.

It may also be said that peculiar curdling effects have been obtained with fresh milk from the cow and of various ages thereafter. This may account for certain peculiar cultural results secured in cultivating germs in various samples of milk.

A Case of Noma Cured by Means of Red Rays.—Another triumph of phototheraphy is recorded in the successful treatment of that dread malady, cancrum iris, by W. O. Motshan (Arch. f. Kinderheilk., Vol. 40, Nos 4 to 6). The patient was a nine-year-old boy, who after having passed successively through scarlatina, varicella and measles, developed noma of one cheek, which went on to perforation. Immediately upon the admission of the case to the hospital, the local use of red rays by means of a 16-candle power incandescent lamp with a red globe, was resorted to. The wound alone was exposed to the rays. The results of this treatment were soon apparent. On the third day pain disappeared. Seven days later the anterior half of the wound was filled with granulations. The necrotic areas gradually diminished. Two months later the patient was presented before the Pediatric Society of St. Petersburg, entirely cured.

Researches in Dementia Praecox.—A. D. Ormea and F. Maggiotto (Gazz. deg. Osped., January 22, 1905) report the following observations on the urine of cases of dementia praecox. They believe a definite relation may be established between the limination of methylene blue and the clinical symptoms of depression and excitement. They arrive at the following conclusions: (1) In dementia praecox there is a special and characteristic alteration of the process of excretion, which shows (**a**) by means of the elimination of methylene blue through the kidneys, which begins and reaches its maximum intensity with great delay and is prolonged far beyond the time customary in normal individuals; (**b**) by the character and composition of the urine, in which the total quantity is diminished and the specific gravity is reduced; with a great reduction of area, uric acid, phosphates, sulphates, nitrogen, and total acidity, with a slight increase of chlorides. (2) The elimination of methylene blue in other psychoret, manic-depressive insanity, hysteria, phrenasthenia, melancholia, of involution and dementia paralytica, is always more rapid than in normal individuals. (3) These types of mental disease do not show the same variation in the urine corresponding to the symptoms of depression and excitement. (4) These observations suggest that dementia praecox is an idiopathic form of disease, quite distinct from other kinds of psychoses, and based on the alteration of the excreted materials, probably produced by the blood vesels in the sexual organs—resulting eventually in a systemic and partial degeneration of the brain. (5) The elimination of methylene blue in this characteristic way shown in dementia praecox can be used to diagnose this disease.

Fresh Cold Air Treatment of Pneumonia in Infants.—W. P. Northrup (Med. Rec., February 18, 1905) reports two cases of pneumonia in infants in which the windows of the sick-room were kept open day and night; both children recovered. He believes it will become more and more the rule to treat pneumonia in this way. Cool, pure air, he says reddens the blood, stimulates the heart, improves digestion, quiets restlessness, and aids in overcoming toxemia. He concludes with the following prescription for killing a baby with pneumonia:

Crib in far corner of room with canopy over it. Steam kettle; gas stove (leaky tubing); room at 80° F. Many gas jets burning. Friends in the room, also the pug dog. Chest tightly enveloped in waistcoat poultice. If child's temperature is 105° F. make a poultice thick, hot, and tight. Blanket the windows, shut the doors. If these do not do it, give coal tar antipyretics and wait.

BOOK REVIEWS

Practical Dietetics.—Diet in Health and Disease. By A. L. Benedict, Buffalo, New York, Member American Gastro-Enterological Association, Medical Society State of New York, etc. 12 mo. 400 Pages. Green Buckham, Gilt Side Title and Top. $1.50 Net. Chicago: G. P. Engelhard & Company.

Dr. Benedict has given us in this duodecimo a series of straightforward and simple definitions of the general forms contained in the dietary of diseases. No attempt has been made to give a very exhaustive dissertation but the important outlines of dietetics have been very carefully presented.

We can cordially recommend the work to physicians who naturally balk at reading an enormous volume.

Surgical Treatment of Brights Disease. By Dr. Geo. M. Edebohls, A.M., M.D., LL.D., Professor of the General Diseases of Women of the Post-Graduate Hospital, New York City. F. F. Lisiecki, publisher, New York.

Dr. Edebolhls has extended his modest little contribution on the Renal Decapsulization into a volume of three hundred and ninety or more pages. It consists principally of a series of reprints of his papers which have appeared from time to time, also notice of results in operations of seventy-two (72) patients with complete history.

He shows that, whereas seven of these patients have died within two weeks following operations, and twenty-two died at periods more or less remote from the operation, forty are known to be living. These seventy-two cases embrace all of his operations for chronic Brights disease up to and through 1903. From his own synopsis, it cannot be said that the results have been striking. Seventeen cases cured—it being doubtful whether any were really cured or not.

At all events, notwithstanding the author's point of view, the results obtained by a number of foreign specialists along the same lines, and the present precedent will do much toward bringing into prominence the form of treatment for the heretofore intractable diseases, and as such are worthy of extended study.

PEDIATRICS

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ORIGINAL ARTICLES

SYSTEMATIC EXAMINATION OF SICK CHILDREN*

By James W. Rowe, M.D.,
of Cincinnati

The physical examination of young children presents many difficulties, which are, fortunately, not entirely uncompensated by certain advantages. The difficulties arise from the inability of the little patient verbally to explain his symptoms, his liability to become frightened and consequent tendency to cry and struggle. The advantages consist in the impossibility of prevarication or dissimulation and the ease with which he is stripped and moved about. Withal, the undertaking requires patience and peculiar tact.

To begin with, the mother or nurse is called upon to answer a number of questions. If the conversation is carried on in a comfortable way it may do something toward soothing the natural agitation of the child in the presence of a stranger.

It is interesting, at first, to get the mother's view of the case. What has especially excited her alarm? Why has she called in a doctor? These are naturally the first questions, and they are not unfraught with danger, for the answers may mislead the practitioner. It often happens that some striking, but really insignificant condition makes a great impression on the mother's mind, while an important but less showy symptom escapes her entirely.

A few questions about the rest of the family, and especially about the parents, are here in order, particularly with reference to syphilis, tuberculosis and nervous diseases. Some tact must naturally be employed. It is a practical point in this connection that constipation in children may often be explained on the basis of heredity.

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The previous history of the child itself should be investigated, its size at birth, the method of feeding, its rate of growth and development, and any former illness. Previous medical treatment, if this can be discovered, is of great importance. The laity have a well-known penchant for "getting the bottle refilled" without the knowledge of the physician, and great harm may be done by the continued, unguided administration of such drugs, as, for instance, Fowler's solution or Dover's powder.

Finally the present illness is to be considered—its mode of onset, duration, symptoms and severity.

We now proceed to the actual physical examination. Of all methods, inspection is the most serviceable and important, and should be first employed. If the little one is old enough to understand at all, the physician gains something by discarding his professional and searching stare and assuming a more kindly expression of countenance. Before undressing the child at all its head, face, neck and hands may be observed. The baby's head presents a much larger fraction of the entire anatomy than does the corresponding part in an adult, and the information to be obtained from it is very considerable. Eye diseases, skin diseases, facial deformities and blemishes are so evident that they attract attention at once.

Eyes.—Intra-canial diseases are often indicated by the condition of the eyes, *e. g.,* suddenly arising strabismus, unequal pupils, or widely dilated pupils that do not respond to light. In cases with dilated pupils previous medication should be inquired into. It may be discovered that they are due to overdosing with belladonna, administered, possibly, for nocturnal incontinence of urine. The pupils are likely to be contracted in beginning meningitis, and they are always so in opium narcosis and normal sleep. Nystagmus may be a sign of tubercular meningitis or only a temporary neurosis. Corneal ulcer and interstitial keratitis point to congenital syphilis. Eyes that are imperfectly closed, that have lost their lustre and are coated with a film, *ceteris paribus,* betoken approaching death.

Face.—A peculiar expression of attending strictly to business, eyes with a weary but anxious look, flushed cheeks, lips parted and nostrils dilating, speak very forcibly for pneumonia. A face expressive of determination or profound thought, utterly inconsistent with childhood, the head being at the same time drawn back, indicates meningitis. The face of adenoids presents a rather stupid appearance; the anterior nares are generally small, the mouth always open. Puffiness of the face, especially under the eyes, suggests Bright's disease, or too much arsenic. A paralysis of one-half of the face is frequently seen in the newly-born, resulting from pressure by the forceps upon the seventh nerve as it emerges from the stylo-mastoid foramen. The paralysis is easily recognized when the child cries, and may account for difficulty in teaching it to nurse. On the face are observed several distinctive signs of syphilis. A nose, the bridge of which has fallen in, scars around the mouth, extensive sores on the upper lip resulting from the acrid discharge of ozena, and finally in older children the notched upper incisors, all proclaim this disease. The dreadfully emaciated face of chronic diarrhea is only too familiar. Cretinism is by no means a common condition, but its characteristic heavy, unintelligent expression should not be forgotten.

Head.—The inspection of the head will bring out several points of interest. There is great difference in the size of heads, and it is only when the cranium is quite small in comparison to the face and the rest of the body that the head should be styled microcephalic. The opposite condition is more interesting. A very large head, with widely open fontanelles and distinct veins coursing over it, where the forehead seems to overshadow the face, the expression of which is rendered still more peculiar by the presence of ptosis, indicates hyprocephalus. The head of rickets is square, with protruding temples and an anterior fontanelle still open in the third year. A bulging fontanelle indicates increase of intra-cranial pressure. With sufficiently active congestion it will pulsate as well as bulge.

Hands.—A glance may now be taken at the hands. The condition of general nutrition is easily learned from them, and it always inspires a certain amount of confidence in the little patient's constitution if the wrinkle around the wrist, so characteristic of the healthy breast-fed baby, is in evidence. If paralysis exists, the practiced eye may be able unaided to discern whether it is flaccid or spastic, and thus refer the causal leson to its proper centre. Of especial importance are clubbing and blueness of the finger ends, pathognomonic of lung or heart disease.

Neck.—In newly-born babies a lump on the side of the neck is likely to be hematoma in the sterno-mastoid muscle. After infancy swellings in the neck generally arise from enlarged lymph-glands, which may be tubercular or may indicate diphtheria, scarlet fever or superficial lesions on the scalp. Rigidity of the neck is noted, if present, in connection with an abnormal extension of the head. One should remember to look at the back of the neck at the roots of the hair. Scabs and sores here, resulting from the scratching of a chronic eczema, indicate almost infallibly the presence of pediculi capitis, when other signs have escaped observation.

Body.—It is now in order to inspect the child's body, and for this purpose it should be stripped. In the possibility of doing this lies our greatest advantage. It is better, however, to take the child's clothes off in another room and to bring it in wrapped in a blanket. The undressing in the presence of a stranger may cause disturbance.

Skin.—The general color and appearance of the skin is noted; it may be yellow, indicating jaundice; cyanotic, indicating heart trouble; of extreme pallor, indicating some form of anemia. A too moist skin suggests rickets, whereas the skin of chronic diarrhea is dry and harsh. The presence of any form of skin disease is generally apparent at once; the exact diagnosis is often a more complicated matter. The rose spots of typhoid should not be overlooked in cases with fever.

Chest.—On inspecting the chest we first observe the precordia. If it bulges and pulsates to any considerable degree, as it may do on account of the softness of the chest walls, a cardiac hypertrophy is indicated. Pulsation in the vessels of the neck and in the epigastrium are also to be noticed in this connection. In young children, however, the impact of the apex may be seen in the mamillary line, or even beyond it, without indicating any enlargement of the heart. Marked distension of the veins in the upper part of the chest indicate swollen bronchial glands. The child's chest is more cylindrical than the adult's, and as its walls are still soft may present various modifications of form resulting from disease. One side may be smaller than the other, or remain comparatively immovable during respiration as a result of pulmonary disease, *e. g.*, atelectasis, or there may be contraction of one side from old pleurisy or collapse. The chest in rickets shows the well-marked beading along the costal cartilages, known as rachitic rosary, and a transverse groove at about the level of the ensiform cartilage due to the pulling action of the diaphragm. John Thompson, of Edinburgh, calls attention to a posterior beading. The enlargements are not found on all the ribs, and are asymmetrical. They are due to calluses around green-stick fractures caused by careless handling of an already rachitic child. Pigeon-breast is generally due to some chronic interference with respiration, as recurrent bronchitis or protracted whooping-cough.

Breathing.—The character of the breathing is to be particularly observed. It is important to see if the two sides move equally, and if there is any drawing of the epigastrium. The latter, when marked and when accompanied by other symptoms of pulmonary disease, and especially by the action of the accessory muscles of respiration, with sinking in of the supra-sternal area, indicates that sufficient air is not entering the lungs, and is always a serious sign. It occurs chiefly in broncho-pneumonia and laryngeal obstruction. These conditions may be distinguished from each other by the difference in the character of the breathing; that of broncho-pneumonia is rapid and superficial, that of laryngeal obstruction slower and labored, with short inspiration and longer expiration. The latter condition, accompanied by sinking in of the epigastrium, etc., calls for immediate tracheotomy. Infants with dyspnea have great difficulty in suckling. A retraction of the abdomen during inspiration indicates paralysis of the diaphragm.

While observing the chest the rate of respiration should be noted, which in infants under one year is normally thirty-five per minute, and gradually diminishes in frequency as age advances. Respiration may be very rapid in children, reaching eighty or more per minute in broncho-pneumonia. Rapidity of breathing by no means always indicates disease of the respiratory tract, as it occurs in almost any fever. The peculiar form of breathing known as Cheyne-Stokes' may be observed in meningitis, acute or tubercular. There is often a peculiar disturbance in the rhythm of breathing in children with beginning pneumonia. Ordinarily we have inspiration, expiration, pause, but in these cases we have a loud and long expiration, a short inspiration, and then a pause.

Abdomen.—The abdomens of children are always large normally, but may protrude excessively from tumors, gas, feces or fluid. In meningitis, on the contrary, the abdomen is often flat, or even concave—boat-shaped. The navel calls for examination, as the seat of umbilical hernia, and, in infants, of septic infection and bleeding.

Genitalia.—The genitalia are inspected for pathological discharges and deformities, *e. g.*, undescended testicle. In the case of male children it is especially important to examine the prepuce, which may be long, tight, adherent, and provided with too small an opening. A disease indistinguishable from gonorrhea is not uncommon, at least in hospital and clinic practice, in little girls.

Anus.—On looking at the anus, the discovery of a pin-worm may explain a great deal of sleeplessness, and the discovery of a prolapsed rectum a great deal of crying. The common occurrence of intertrigo in this region need hardly be mentioned.

Limbs.—The limbs vary greatly in their form and development, and deformities are frequent from congenital conditions, accident and rickets. In meningitis the feet are often turned with the soles inward, in tetany they are in a straight line with the leg, in hydrocephalus they are much under-developed. Swollen joints may indicate injury, tuberculosis or rheumatism. The discovery of rheumatic nodules is particularly interesting. These are little masses of white fibrous tissue located usually over the patella or olecranon. Periosteal nodes on the tibia indicate syphilis.

Back.—The back offers for consideration the various conditions due to disease or deformity of the vertebral column. There are two of especial diagnostic importance—rickets and Pott's disease. Both are kyphotic, but in the former the curve is wide and will disappear upon pulling the legs, whereas in the latter the deformity is fixed and angular. Lordosis may result from a congenital dislocation of both hips.

Mouth.—The inspection of the mouth and throat may be delayed until the rest of the examination is complete, as the child will almost invariably cry and struggle. Crying is not entirely a disadvantage, for when the mouth is open wide it is possible to get a good look at the interior. The great desideratum is to have the child properly seated on its mother's lap, facing a good light, daylight, if possible. A very clever device for lighting up the oral cavity is suggested by Henoch. He recommends the use of a common candle, the flame of which is backed by the polished bowl of a tablespoon. It is easy to hold both in one hand while the other is busied with the tongue depressor.

Lips.—The lips are first noticed. Herpes labialis or other sores may be present; blueness indicates circulatory disturbance; pallor, anemia. Peculiarities and inflammation of the gums should not escape observation, nor, in older children, mercurial and Hutchinson's teeth.

Tongue.—The tongue of very young infants is always rather dry, and often has a coated appearance. Occasionally the peculiar marked geographical tongue is observed. Abnormal shortness of the frenum may account for difficulty in nursing. It often happens that a refusal to nurse properly, especially in the case of bottle-fed babies, is explained by a comparatively slight catarrhal inflammation at the tip of the tongue. An ulcer under the tongue may occur in whooping-cough. The so-called strawberry tongue suggests scarlatina, and a tongue thickly coated on the dorsum and clean at the sides occurs in typhoid fever.

Palate.—The palate may be the seat of ulcers. Especially should it be carefully examined in cases of suspected measles, scarlet fever, chicken-pox and smallpox. Occasionally the palate shows perforations as a result of syphilitic or tubercular disease. The Gothic arch is usually not marked until after the second dentition.

Cheeks.—The inner surface of the cheeks as well as the other structures in the mouth are examined for the various forms of stomatitis, especially remembering the little white patches of thrush.

Fauces.—Some form of tongue depressor may be used to get a good view of the fauces. A spoon handle is about the best, as it is a familiar object and does not frighten the child. The size of the tonsils is quickly noticed and the presence or absence of white spots or membrane on them. The condition of the soft palate and pharynx is then observed, not forgetting the possibility of retro-pharyngeal abscess.

Palpation.—Palpation succeeds inspection, except that of the mouth and throat, which should be reserved until the conclusion of the entire examination. It is useful in confirming many things already observed, *e. g.*, open fontanelles, beaded ribs, heart impulse, enlarged glands. The hand should be warm and the touch gentle. When search is made for locations painful upon pressure, the child must first be soothed and its attention distracted, so that the discovery of the painful spot elicits the cry. If already crying it is hard to say where the tenderness lies or whether pressure is painful at all. The hand appreciates moisture and dryness much better than the eye, and can also appreciate muscular tone.

Head.—The head is palpated for craniotabes in cases of suspected rickets. A cephalhematoma on the head of an infant sometimes leads to an error in diagnosis from the peculiar way in which it heals. New bone is deposited around the periphery of the swelling while the centre remains soft, so that the impression of a depressed fracture is given, and if the delivery was instrumental the forceps are blamed. Firm pressure over the soft centre will discover solid bone beneath. Palpation is necessary to discover abnormal stiffness of the neck muscles when the head is retracted.

Chest.—On palpating the chest the vocal fremitus may be felt by making the baby cry. A rhoncial fremitus due to the vibration caused by bubbling mucus in the bronchial tubes is occasionally felt. This is rendered possible by the fact that the chest walls, even in well-nourished children, are quite thin.

Abdomen.—Enlarged liver or spleen is discovered on palpating the abdomen. It should be remembered that the liver of a child is, normally, big. If the spleen is enlarged it may signify in acute cases, malaria, typhoid, or tuberculosis; in chronic cases, malaria, syphilis or some form of anemia. Some authors assert that enlarged mesenteric glands may be felt through the abdominal wall, but this must be rather a difficult task unless the abdominal wall is thin, the glands very big and the examiner skillful. Swellings in the groin require the aid of palpation in diagnosis. The cough or crying impulse distinguishes hernia from swollen lymph glands or undescended testicle.

Pulse.—It is sometimes very difficult to feel the pulse at the wrist, and it certainly must require incredible skill to recognize in the tiny pulse of an infant those peculiarities which are described in the pulses of adults. The pulse-rate may be much more easily learned by listening to the heart. It must be remembered that the child's pulse is much more rapid that that of an adult, and that it may be considerably accelerated by comparatively trifling causes. It is better, when possible, to take it during sleep.

The slowing of the pulse in icterus, so marked in adults, is not observed in children, but in convalescence from fevers it may be slowed somewhat. In tubercular meningitis, at the beginning the pulse is slow and irregular, at the end it is fast. In scarlatina the pulse is very rapid. The relation of pulse to respiration should be considered.

Temperature.—Temperature may be approximately estimated by the touch, but the thermometer is much more reliable, and should be used in the rectum. Care must be taken, for a thermometer broken off in the rectum, a circumstance which might easily happen from some unexpected movement on the part of the little patient, would prove a very uncomfortable contingency. One must be on the lookout also for the proximity of artificial sources of heat—hot-water bags, etc.—which might elevate the column of mercury by their too close proximity. The normal temperature varies from 98 degrees to 99.5 degrees. Comparatively slight causes may send a child's temperature to an alarming height, but high temperatures are important only when they are continuous. Abnormally low temperatures are also observed, especially in premature children, in diseases accompanied by much loss of fluid, in starvation and atelectasis, and even cases of pneumonia and meningitis have been reported in which the temperature has been subnormal throughout.

Auscultation.—Auscultation is practiced before percussion. Whether or not a stethoscope is used must depend upon the habits of the examiner. It is a question whether the stethoscope frightens the child more than the proximity of the physician's head when the ear is placed directly to the chest, and there may be some objection on the part of the physician to putting his ear in this position. Sometimes the child may be influenced to play with the stethoscope for a few moments and its fright thus overcome. Some authors recommend an instrument with flexible tubes, holding that the movements of the child cause less embarrassment, as the bell can be held continuously against the chest; others consider that such instruments convey adventitious sounds, and prefer a simple straight stethoscope for one ear. In any case, if a stethoscope is used the bell ought to have a soft rubber rim. The bell of the instrument should be held between the thumb and finger of the examiner firmly against the chest, and follow thus the movements of the patient's body. A very important requirement in the case of a binaural stethoscope is that the ear pieces should fit the ear canals of the examiner. As stethoscopes are not made to order this is left entirely to chance.

Upon auscultating the open fontanelle it is often possible to detect a blowing murmur. While this may be somewhat louder and of more frequent occurrence in rachitic and anemic children, it occurs in perfect health, and therefore has no definite pathological significance.

Heart.—For the examination of the heart a stethoscope is necessary. The difficulty of the task is still further increased by the rapidity of the heart's action. In young children the first sound is louder than the second because the calibre of the arteries is comparatively large and the recoil of blood against the semilunar valves is not so forcible. The pulmonary second sound is louder than the aortic, but not so loud as the first sound in the same area. If, therefore, the pulmonary second sound is as loud or louder than the first, it is to be considered accentuated. Murmurs in the child's heart may arise from three conditions—congenital malformations, acquired valvular defects, or they may be entirely functional. The possibilitiy of anemic murmurs at the base should not be forgotten, but these, together with other functional murmurs, are, according to Henoch, very rare in children under five years of age. During the first few years abnormal sounds indicate valvular lesions. Functional murmurs, when they occur in older children, are, as a rule, soft; loud murmurs, systolic in character, indicate congenital deformity. Diastolic sounds are rare before six years. In contra-distinction to later life, heart disease in children is pre-eminently a wasting disease.

Lungs.—In the examination of the chest for disease of the respiratory system some valuable auscultating may be practiced before putting the ear to the chest. It is of great advantage to listen carefully to the breathing, the cry and the cough.

Breathing.—Snuffling breathing may indicate simply a cold in the head; long continued, it points to syphilis. Snoring in sleep, noisy breathing when awake and a nasal tone of voice indicate enlarged tonsils or adenoids, or in rarer cases diphtheritic paralysis of the soft palate. Noisy breathing with dyspnea will suggest retropharyngeal abscess. Sighing may mean nothing or may announce tubercular meningitis. Stridulous breathing may be due to spasm or to real obstruction. Bronchial wheezing is often audible without applying the ear to the chest.

Cry.—The possibilities of information from the character of the cry have been exaggerated. The cries of hunger, pain and discomfort are often very much alike, and the cry of temper, so-called, in infants is a doubtful quantity. Certainly long experience and great acuteness would be necessary to distinguish them apart, were it not for other accompanying signs. In any case, a loud, lusty yell gives great assurance of the condition of a child's lungs, and if with a vigorous cry flatness or dullness is found in some part of the chest, a pleuritic effusion is indicated rather than disease of the lung itself.

A cry which has long been held of great diagnostic importance is the piercing scream, known as hydrocephalic and characteristic of tubercular meningitis. Similar screaming, however, is heard in middle-ear disease, and the crying of intussusception is also very violent. In marked contrast to these is the crying of pneumonia, which is feeble and interrupted. A harsh, hoarse tone, when chronic, is characteristic of syphilis. Crying from hunger, pure and simple, is usually interrupted by sucking of the fists, and crying which is silenced by placing the baby on its stomach over the knee is generally due to gas in the intestine, *i. e.,* colic.

Cough.—There is some distinction in the nature of the cough, as evidenced by the terms tight and loose. The former is characteristic of irritation in the larynx before much secretion is established, the latter indicates the presence of quantities of mucus. The cough of pneumonia is short and suppressed, because it causes pain. When a child coughs loudly without wincing it is evidence that the pleura is sound. A cough worse at night, occurring in paroxysms, leading to vomiting, is almost certainly whooping-cough.

Direct Auscultation.—Direct auscultation is most satisfactory at the back of the child, because it is so easily held looking over the mother's shoulder. It is, however, not alone sufficient; the front and sides must also be examined. Crying affords considerable difficulty in the way of satisfactory auscultation, yet it offers some compensation in the fact that it forces the child to take deep, long breaths, at which time the conduct of the lungs may be made out. Whimpering is a much greater disadvantage than vigorous crying. For the apices of the lungs a stethoscope is necessary, but for the rest the application of the ear directly to the chest will brobably prove the most satisfactory method.

Auscultation of the lung on the left is rendered difficult by the heart sounds, which are heard all over this side, but even when the heart is heard distinctly over both sides of the chest it does not mean consolidation, for the child's chest conducts sounds much better than the adult's. The fetal chest conducts it even better than the child's.

Although the breath sounds in very young infants may be rather weak, as growth progresses they rapidly acquire a harsh sound, known as puerile, which is to be considered normal. The breathing sounds close to the ear as a result of the thinness of the chest wall. If the two sides of the chest differ in loudness, the weaker one is to be suspected. Tubular breathing is occasionally met with in pleurisy with effusion, as well as in consolidation. In pleurisy beginning, the friction sounds sometimes fail in young babies, and we must depend upon the appearance of the breathing for diagnosis. The child will give evidence of sudden pain before the completion of inspiration.

According to Holt, the commonest errors made in the auscultating of children's chests are the mistaking of bronchial breathing for friction sounds, of puerile for bronchial breathing, and the overlooking of fluid because bronchial breathing is present.

Percussion.—Percussion follows auscultation instead of preceding it, as is generally the case in the examination of the adult. Care must be taken that the child is sitting or lying straight, so that its sides are symmetrical and due allowance must be made in estimating the value of sounds elicited from deformed chests. The thymus dullness extending down to the third rib in the centre should not be forgotten.

The front of the chest may be percussed with the child lying on its back, but for the sides and back it should be placed in a sitting posture. The pressure on the abdomen, if it lies face downward, will force upward the diaphragm and give rise to sounds abnormally dull.

Percussion should be gently done with warm hands and the pleximeter finger should not press too firmly, as the chest walls are very elastic. The percussion should be light, or superficial areas of dullness may escape notice. The chest should be percussed during both expiration and inspiration, a process which takes patience, as small children have a trick of holding their breath. For obvious reasons the ability to do this is a good sign. Dullness over limited areas may be due to areas of collapse, old pleurisy, or if over the sternum to enlarged bronchial glands. A cracked-pot sound may be obtained from the chest of infants with perfectly normal lungs on account of the yielding character of the chest walls. Especially is this the case at the back between the scapulæ. Further than this, percussion does not differ materially from that of adults.

The examination of the blood, the secretions and excretions, yields very valuable and often indispensable information. The consideration of these matters at length, however, would open up a field too extensive for the limits of this paper.

In dealing with acute cases and attempting to arrange for diagnosis, the facts obtained by careful, systematic examination it is well to bear in mind the commonest diseases of childhood in the order of their frequency—acute indigestion, pneumonia, pharyngitis, the acute infectious diseases, meningitis, tuberculosis, rheumatism and nephritis.

It has not been the writer's object in preparing this paper to present anything new and startling, but rather to recapitulate and rearrange knowledge which has been for a long time lodged in more or less accessible corners of medical brains the world over—a process which, occasionally at least, is not without its merits and advantages.

TREATMENT OF CEREBRO-SPINAL FEVER

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In reviewing the treatment of cerebro-spinal fever we have to consider the management of a self-limited infection of known etiology and great mortality, with a death rate that differs widely in different epidemics. To begin with, we have to confess that the sanitarian, as relates to this disease, is more useful than the therapeutist. The study of epidemics shows that overcrowding, bad ventilation and drainage are largely responsible for the transmission of the affection. A striking illustration of this is shown in the experience of Surgeon C. F. Stokes of the Navy (*Record of the Surgeon-General of the Navy,* 1903, p. 229). An epidemic occurred on board the ship Minneapolis, whose normal complement is 500 men, but which at the time of the outbreak carried 1,450. The disease developed for the most part on the main deck, which was especially overcrowded and lacking in ventilation, whereas in the less crowded parts of the ship the disease made little headway. While this view does not explain sporadic cases developing under apparently good hygienic conditions, there is convincing evidence that isolation should be resorted to wherever possible. Much might be added in support of this apparently self-evident view of the subject. The problem is a familiar one in epidemiology.

Formerly the treatment of the disease consisted in the early employment of blood-letting, either general or local, the use of mercurials in repeated and rather large doses, ice locally, the employment of opium and other cerebral sedatives. In this country the extraction of blood found little favor, and most physicians were content to use mercurials in moderation. Cerebral sedatives, on the other hand, were constantly employed, generally for the relief of the symptoms, pain, coma and convulsions. Of these, opium, as recommended by Stillè, was most largely employed, while others preferred full doses of bromine salts and other antipyrin or chloral. The application of ice to the head and along the spine, or counter-irritation at the nape of the neck with the internal use of ergot, found favor with many.

These measures still have advocates, and there remains a question as to whether their use is to give way to more modern methods. Among the plans of treatment which have of late years attracted most attention, the foreplace must be given, first, to the hot bath as recommended by Aufrecht; second, to spinal puncture and drainage as practiced by Quincke, with or without irritation of the spinal canal with antiseptic solutions and other medicinal agents; and, third, subcutaneous injections of corrosive sublimate.

It seems necessary briefly to review the present status of these methods. First, the hot bath treatment. Aufrecht in 1894 (*Therap. Monats.*, vol. 8), reports a sporadic case, in coma for about eleven days, with weak pulse, subnormal temperature, and grave danger of collapse, in which he ordered the baths at forty-eight degrees Centigrade (104 degrees to 106 degree Fah.), continued for ten minutes. After the first bath the symptoms improved, the pulse became stronger, with decrease and stiffness of neck, and a return to consciousness. The treatment was contined for twelve days, after which the cerebral symptoms disappeared.

Worschiliski (*Therap. Monats.*, vol. 18, 1895,) following the experience of Aufrecht, treated two cases by the hot bath treatment, also employing drugs. In the first case the baths were begun on the eighth day. The same striking improvement was seen as in Aufrecht's cases; that is, an improvement in the pulse, in the comfort of the patient and decrease in the stiffness of the neck and headache. After the eighth bath, the symptoms practically disappeared. Besides the baths, he employed calomel, 0.06 four times a day, enemata, potassium iodide, unguentum hydrargyri and leeches. In the second case the baths were begun on the sixth day. The first was followed by general improvement, the patient sleeping the first time during the illness. The baths were repeated twice daily at the patient's request. On the twelfth day they were discontinued because of the appearance of pericarditis and arthritis of the left side. The headache and other symptoms reappeared so that the baths were resumed on the eighteenth day and continued for three days longer, when the symptoms disappeared and recovery slowly followed. The writer concludes that the hot baths are not contraindicated in pericarditis.

Jerwin (*Therap. Monats,* vol. 10, 1896), reports five cases in which he followed Aufrecht's method with recovery in each case, and says that the indications for their use are subnormal temperature, small, weak pulse, and threatened collapse, headache, stiffness of neck and nervousness. He believes that the baths are without danger.

Wolisch (*Therap. Monats.,* vol 10, 1896), adds the report of seven cases in children treated by Aufrecht's method, with five recoveries and two deaths, a mortality of twenty-eight per cent. He states that one fatal case was fulminating, and that in the other, owing to the objections of friends, the treatment was omitted until too late in the course of the disease. This author believes that hot baths lower the temperature, quiet the nervous symptoms and improve the heart tone.

Netter, before *La Societe Medicale des Hopitaux de Paris,* 1900, reports seven cases, all of which showed the presence of diplococcus intracellularis, in which he combined the treatment of hot baths in conjunction with lumbar puncture. There were five complete recoveries, one with resulting ankylosis in two joints following arthritis, and one in which the result was doubtful. He continued the baths for twenty minutes, and repeated them every three hours.

Turner in his Paris letter (*Therapeutic Gazette,* July, 1900), mentions eleven cases of his own in which seven recovered and four died, a mortality of fifty-seven per cent. But of the four fatal cases, three were under treatment but one day before death.

Schlesinger, Anhauch and Steckel (*Wiener Med. Woch.* vol. 46, 1896), report a number of cases in which the hot pack had been used apparently with relief of symptoms, but with a mortality varying from thirty to forty per cent.

Urban (*Wiener Med. Woch.,* vol. 47, 1897), reports six cases with a mortality of fifty per cent., but believes that the hot bath treatment, Aufrecht's method, serviceable in the relief of symptoms.

E. Blavot (*Centblt f. Bacter.,* July 12, 1901), says that Aufrecht's method combined with lumbar puncture has proved in his hands almost invariably successful even in severe cases. When the condition is grave, he would prolong the bath to twenty-five minutes, and recommends its use every three to four hours day and night, the patient being moved in a blanket. He considers the lumbar puncture of great assistance in diminishing the intra-cranial pressure as well as removing toxic substances. In conjunction he would use salt-transfusions, calomel and opium internally and iodoform locally.

Aufrecht's method does not appear to have been widely practiced in this country, although in a recent discussion before the American Medical Association it was stated that repeated hot baths were recommended and somewhat widely employed as early as 1873 in some portions of this country, and that their use was attended with considerable success. It will be noted that the method of employing hot baths as to duration and frequency varies considerably with different clinicians, and that in some instances the treatment was associated with the employment of drugs. Reports favor the hot bath treatment, and yet the high mortality rate given in some reports is not to be forgotten. Apparently the practice is harmless, is generally followed by the relief of symptoms, and in some instances at least apparently has had a favorable effect upon the course of the disease.

Concerning the treatment of lumbar puncture, Seagers (*Lond. Lancet,* 1902), reports thirty-one cases in which this method was practiced, followed by injections of from nine to twelve cubic centimetres of one per cent. lysol solution. There was a mortality of forty-two per cent., but he explains that the patients were from the lower classes and in bad condition, and occurred in the Lisbon epidemic of 1901-1902. He compares the results with the early treatment by hot baths which gave a mortality of sixty per cent., with simple lumbar puncture in twenty cases which gave a mortality of forty-five per cent., eleven cases with puncture, followed by injection of oxy-cyanide of mecury, which gave a mortality of fifty-nine per cent. The author also refers to the Oporto epidemic of 1901, giving a mortality of sixty-one per cent.

Morris Manges (*Medical News,* May, 1904), reports three cases treated by intraspinal injections of lysol solution with recovery in each case. He expresses the opinion that lumbar puncture is superior to the hot bath of Aufrecht. He uses ten cubic centimetres of the one per cent. solution of lysol. He believes in children the dose should be from three to nine cubic centimetres.

Nammack (*Med. Record,* June, 1904), reports five cases in which he employed intraspinal injections of fifteen cubic centimetres of ten per cent. lysol solution, explaining that the solution employed was through a misunderstanding stronger than he intended. Of the five cases, four died, a mortality of eighty per cent. However, in the same epidemic with various forms of treatment, of twenty-nine patients admitted to the Bellevue Hospital, twenty-four died, a mortality of ninety per cent.

Koplik (*Med. News,* vol. 84, 1904), believes that lumbar puncture is not curative, although most advantageous in diagnosis. He consents to its use for the relief of pressure symptoms. He points out that it is unfortunately unavailing in cases with extreme retraction of the neck with rigidity, the very cases in which its employment would be most indicated to prevent the danger of sudden dilatation of the ventricles. This author quotes Osler, Connetti, Treves and Smith as advising lumbar puncture for the relief of pressure symtoms.

Quincke (*Berl. Klin. Woch.,* 1895), in his original report on lumbar puncture reports its effect on fifty-three cases, from which he withdrew from three to sixty cubic centimetres on an average of twenty cubic centimetres of cerebro-spinal fluid, and considers that it has a therapeutic value in the relief of pressure symptoms. He compares its effect with that seen after aspiration in pleural effusion.

F. H. Williams (*Boston Medical and Surgical Jour.,* vol. 137, 1897), after reporting this form of treatment in thirty-nine cases in the Boston City Hospital, with a mortality of fifty-nine per cent., concludes by advising lumbar puncture for early diagnosis and for the relief of pressure symptoms.

Councilman, Mallory and Wright (*American Journal Medical Sciences,* March, 1898), report that no ill-effects were seen from a large number of spinal punctures made in the Boston epidemic, and quote Williams as believing that the practice is sometimes positively beneficial, referring to a state of quiet and sleep following the operation.

Antony (*Archives de Medicine et de Pharmacie Militaire, Paris,* vol. 42, 1903), after referring to its importance as a diagnostic measure, speaks of the utility of lumbar puncture in the treatment, claiming for it the lessening of pressure symptoms and more rapid defervescence, the disappearance of hyperesthesia and, in some cases, a marked curative effect. He reports five cases of his own with recoveries, two cases without good effect, and two cases stili undecided. He quotes the statistics of Chapault, Babinski and Bernard, as reflecting favorably on the effects of lumbar puncture.

Joseph Collins thinks that puncture has little effect in ameliorating the disease (*Twentieth Century Practice*). From these reports it may be learned that the mortality in cases treated by lumbar puncture, or in which lumbar puncture has been practiced for diagnostic purposes, or in which, following lumbar puncture, injections of various antiseptics have been employed, differs but little from the mortality following other lines of treatment.

The treatment by subcutaneous injections of corrosive sublimate is highly recommended by Angyan (Bela) (Abstract from *Medical Record,* vol. 53, 1898). His plan is to inject subcutaneously along the spinal column .01 of corrosive sublimate in the case of adults, and from .0005 to .005 in children, once a day. In severe cases the injections are repeated as often as the fever, headache and stiffness in the neck continues. In subacute cases the injections are practiced until the temperature disappears. He reports twenty-seven cases thus treated with a mortality of thirty per cent.; the injections, varying in number from four to twenty-four, were as a rule well borne. In most cases, after the second or third injection the mind became clearer, excitability was allayed and the pain less marked, so that the patient could sleep. After the fifth or sixth injection, the mind usually cleared up and sleep was still quieter and of longer duration. He did not hold that the treatment shortened the disease, but that it favorably modified its course.

Dazio and Consalivi (*Semaine Medicale, abstracted from the Journal of the American Med. Asso.,* vol. 26, 1896), report nine cases treated by this method with eight recoveries. The diagnosis was not confirmed bacteriologically.

J. D. Smith (*Jour. A. M. A.,* vol. 26, 1896), reports six cases in which he injected one-fourth to one-fifth grain doses hypodermically, with recovery in each. The diagnosis was not confirmed by bacteriological examination.

On the whole the evidence in favor of this method of practice cannot be called conclusive, to say the least. Miscellaneous measures of treatment which seem worthy of consideration are, first, the opium treatment so strongly recommended by Stillè, Whittaker (*Reference Handbook Medical Sciences*), and a host of others, which finds its indication through its anodyne influence, thus sparing the nervous system until the force of the toxin is abated.

A. Steiner recommends ten grains of gum opium at a dose when convulsions are severe, and has found no stupor to result. Chauffard and Boudin from seven to fifteen grains; Stillè one grain every hour and von Ziemssen morphin hypodermically in sufficient doses.

Nearly all practitioners admit the occasional use of opium, but, as will be seen, there is the greatest difference as to the dose and the indications. Perhaps an equally large number prefer bromides in large and repeated doses. With some this is regarded as the sheet anchor in the treatment of the disease. In connection with bromides, antipyrin is advocated, and has been serviceable in relieving headaches, lowering temperature and lessening hyperesthesia. Ergot has been used extensively either alone or with bromides, and like other remedies has found its advocates, while most continental authorities seem to think that mercury in some form or another, usually in large doses, is a necessary method of treatment, no matter what else is done. In spite of this array of therapeutics we find that the mortality continues large.

Antony, before referred to, has collected 508 cases with a mortality of 339, between sixty-four and sixty-five per cent.

When we recollect the difference in virulence in different epidemics, it is easy to understand how faulty notions as to the effect of measures of treatment may gain credence. Nevertheless, a timely review of the subject would seem to warrant the conclusion that benefit does follow certain of these measures, and from my own point of view, I should conclude that the most useful procedure is the bringing about of the best hygienic condition for the patient; that is to say; first absolute quiet in well-ventilated, darkened rooms, with the absence of all excitement and irritation; second, giving the greatest attention to secure the proper performance of the various functions of the body; third, the trial of the hot baths after the method of Aufrecht in all cases where they seem to do good; fourth, the practice of intraspinal puncture, with drainage where necessary to relieve severe pressure symptoms, to be repeated, if necessary, provided benefit follows the first puncture; fifth, the use of antipyrin in cases in which the temperature is raised, not only for the relief of this symptom, but for the mitigation of headache and hyperesthesia. Personal experience has shown me that the drug is also useful in improving the mental state, and it has not been followed, in my hands, by the expected depression; sixth, the use of opium or the bromides alone, or in connection with antipyrin, if necessary for the relief of convulsions, pain, hyperesthesia and pressure symptoms generally, which are not relieved by the foregoing methods of treatment; seventh, the use of mercury when needed for its laxative effect, or to assist in stimulating the organs of elimination.

OCULAR COMPLICATIONS AND SEQUELAE IN MEASLES AND THEIR PROPHYLAXIS.*

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All infectious diseases of childhood show some signs of their toxicity by a manifestation of ocular symptoms. Particularly are these symptoms well marked in measles. In this rather frequent disease of childhood the ocular conditions manifest themselves early and are characteristic of the disease. The eyes are suffused, red, the conjunctiva, in addition to an increase in its vascularity, is sometimes edematous. The lacrymal glands are over-stimulated so that there is an increase in the lacrymal secretion. The mucous membranes of the nasal duct, lacrymal canal and canaliculi are in a catarrhal state, and the edema interferes with the normal transportation of the conjunctival fluid so that there is an overflow of tears.

There is photophobia due to the hypersensitiveness of the cornea. These are the early ocular manifestations in nearly all cases of measles, making their appearance during the period of invasion, they continue during the second stage, the stage of eruption, and subside during the third stage, the stage of desquamation. These are practically symptoms of a toxic conjunctivitis, the primary cause of which is a toxin circulating within the vascular system. Sometimes the early ocular symptoms do not subside, but rather become intensified during the period of desquamation; especially is this the case in children of weak constitutions, strumous diatheses, scrofulous and tuberculous.

Whenever the ocular symptoms persist during the period of desquamation they are of great importance, and are always fraught with some danger, for in addition to the discomfort they produce they may reduce the acuity of vision, and may cause partial or even total blindness. Various authors place measles as the responsible factor in two per cent. of total blindness. Considering the mildness of the disease, this is an enormous percentage.

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*Read before the Northern Medical Society, Feb. 24, 1905.

Eye symptoms in measles are practically undetermined by both layman and physician. They only serve for diagnostic purposes inasmuch as they appear long before the eruption, long before "Koplic" spots on the mucous membrane of the hard palate are visible. Among the laity they are considered as a physiologic manifestation of a normal childhood phenomenon, and even the physician is apt to forget that they are the result of a circulating toxin within the blood. Many patients that come to the various ophthalmologic clinics, dispensaries, hospitals, and private consulting rooms give, on careful inquiry, a clear history of measles. Some offer the information by saying, "I have been troubled with my eyes ever since I had the measles," or "My child has sick eyes left from the measles," or "The measles got into my eyes," or "I had good eyes until I had the measles."

Often do they call for optical aid because of a reduction in the acuity of vision, and can not be much improved by any lens or combination of lenses. While under careful examination by oblique illumination, corneal opacities, resulting from a healed ulcer that left a cicatricial scar behind, can be demonstrated. The photophobia and discomfort, which as a rule are symtomatic of corneal inflammations and ulcerations, are mistaken by ignorant parents for the ordinary conjunctival inflammation always accompanying measles, so that the condition is often overlooked and these are cases not infrequently met with.

I have met a good number of them in both hospital and private practice. The opacities may be unilaterial or bilateral. In the majority of cases they unilateral. Of the twenty cases on my record, fifteen were unilateral, that is, seventy-five per cent.; as to sex, fourteen were female. In cases of unilateral corneal opacities the defective eye often deviates from its normal axis, producing strabismus, which in the majority of cases is of a convergent type.

The deviated eye is often found to be hypermetropic, of a high or low degree, but the deviation is not caused by the refractive error, but by the centrally placed opacity following an inflammatory condition of the cornea, resulting from measles. This, to be sure, does not occur in the first or second stage, but in the third stage, or post-morbillic stage.

Corneal opacities once formed, and especially if of a marked density, reduce greatly the acuity of vision, the extent of which depends upon the size and site and density of the opacity; it follows then clearly that the treatment must be in the nature of prevention by means of prophylactic measures.

Every case of conjunctivitis requires treatment lest corneal complications set in and damage the eye sight. Why, therefore, should the conjunctivitis of measles be left to kind nature? Every case of ocular complication or sequelæ in measles will show a clinical history of neglect in the beginning and during the entire course of the disease, and therefore they occur mostly among the poor and non-informed. Among them measles is considered a physiologic phenomenon of childhood, rather than an infectious disease, and hence requires no treatment. Preventing measures are unknown to them. At present, among the poor and ignorant a child suffering from measles receives no attention; even in those cases where a physician has been consulted it is only necessary for him to confirm the diagnosis and no further care is required. Some physicians give no instructions in cases of measles, as they are not followed; others gently hint at certain precautions necessary, but they are not heeded.

Rarely in the practice among the poor will the physician, who, by the way, has only made one visit for the purpose of diagnosing the case, give instructions concerning the care of the eye, and even at best he will say, "wash the child's eye with borax water." This order is not followed, and if carried out is not sufficient to prevent complications and sequelæ. There seems to be a belief among the poor that water is contra-indicated in measles. Often the mother will take a rag—and not a clean one at that—dip it in borax water and proceed to wash the eye. It is needless to say that such treatment is of value only inasmuch as it keeps the external part clean, but will have little effect in preventing the development of some more serious ocular condition.

The text books on diseases of children lay very little stress on the care of the eye during any of the stages in measles, and as a result we often find in the clinics the picture of phlyctenular conjunctivitis, eczematous conjunctivitis, keratitis and ulcerations of the cornea. Strabismus is often attributed by the parents to measles. They say, "We noticed the child becoming cross-eyed after the measles;" and I believe this disease to be an important factor in the causation of strabismus.

In some strabismic children the error of refraction is not great enough to be the prime factor in the causation of the deviation of the visual axis. The defect occurs so early in life, about the third or fourth year, when the effort at convergence and accommodation is not greatly strained, so that some constitutional weakness producing paresis of accommodation, which greatly disturbs the relation between accommodation and convergence, must be thought of.

The debility following measles may also act upon the external ocular muscles and weaken them. This, super-added to an error of refraction, is sufficient to disturb the muscle balance and give us the picture of a convergent or divergent strabismus, depending upon which muscle is affected.

Fuchs, in considering the etiology of convergent strabismus, makes the following interesting statement:

"Hypermetropia is not the only cause of strabismus, for if it were all hypermetropes would be obliged to squint. Other factors must conspire in producing this effect. The most important of these factors are those that act to reduce the visual power of one eye, as, for example, when one of the eyes is weaker from birth or when it suffers an impairment of its sight because of disease developing after birth. Among the affections which particularly tend to produce the latter effect is conjunctivitis eczematosa, which leads to strabismus through the opacities of the cornea that it leaves behind it."

Be it remembered that measles plays the most important part in the etiology of conjunctivitis eczematosa. Thus measles may cause strabismus in two ways, first by corneal opacities and secondly the toxemia acting directly upon the nervous element of the intrinsic and extrinsic muscular system, disturbing the equilibrium between accommodation and convergence.

The disease is divided for convenience of description into three stages: (1) stage of invasion, (2) stage of eruption, (3) stage of desquamation. Ocular conditions in favorable cases are of a mild character, and are present only in the first and second stages of the disease, but in many cases they persist in the third stage, when they are of considerable importance. They constitute the ocular complications and sequelæ of the disease. To enumerate them in the order of their frequency they are the following: (1) Phylyotenular conjunctivitis, (2) eczematous conjunctivitis,

(3) marginal blepharities, (4) superficial keratitis, (5) ulcer of the cornea with its occasional bad results, (6) blennorrheal conjunctivitis with corneal complications, (7) obstruction in the lacrymal canal, (8) spasm of accommodation, (9) paresis of accommodation, (10) paresis of external muscles, (11) neuroretinitis, (12) optic atrophy, (13) gangrene of the lids.

Marcel reported a case of bilateral blindness following measles due to an acute degeneration of the retina and optic nerve induced by the toxemia of measles. Groef, Leber and Wood have reported cases of complete unilateral and bilateral blindness. Foster reported cases where the eye was destroyed by ulcerative keratitis.

Corneal complications are very important, as they reduce the acuity of vision, and although rare in the first and second stages of the disease are rather frequent in the stage of convalescence in neglected and strenuous cases. In considering the treatment of the eye from a preventive standpoint it is well to remember the fact that it is the patient that requires treatment, and not the disease.

When summoned to a case and the diagnosis of measles has been made, the physician should immediately inform the parent of the necessity of absolute cleanliness. Those most concerned should be informed of the possible result of a lack of this simple hygienic rule. It would indeed be well to instruct the laity in the hygienic rules essential in this disease. It is a very common disease with a tendency to serious sequelæ of a strenuous character. I have known of no statistics that will give the percentage of corneal opacities resulting from inflammatory conditions complicating this mild disease of childhood, but from my experience I learn that the number is considerable. I have of late met a number of them, and it was this that induced me to bring this practical subject to your notice.

The child's hands should be thoroughly washed three or four times daily, with warm soap water, for children are apt to rub their eyes with their hands and not only increase the irritation but carry infection to them. The face should be kept clean. The child should be kept in a large, well-ventilated room with a uniform temperature and should have a light covering. It should remain in bed for at least two weeks, during which time the toxins are eliminated. The room should be kept shaded; no direct light should be permitted to fall upon the eye. The practice of completely darkening the room I cannot recommend. Light is essential to our lives, and a sick child should not be deprived of it. Full light should be permitted only after the eyes have become normal in appearance and the conjunctival inflammation has completely subsided. By preventing direct light from falling upon the cornea we diminish the photophbia and guard against irritation of the cornea. Always prescribe an eye wash for the children in measles. It has the advantage over the ordinary "borax water," as, being prescribed, it has the necessary instructions how to use it, and the patient is more apt to follow your instructions. Do not allow the use of the rag. In older children the eye cup is very convenient; in younger children, the eye-dropper should be used. The eye should be washed three times daily. A very good antiseptic and soothing lotion is the following mixture:

Acidi borici	*gr. x*
Sodii biborat	*gr. x*
Aqua menth pip	ʒ ss
Aquae camphoræ	℥ ss
Aquae destill	*q. s.* Pint I.

The itching of the eye lids should be relieved by an ointment of vaseline containing ¼ of a grain of yellow oxide of mercury to the drachm. This should be applied at bedtime by gentle massage over the eyelids. This will allay the itching, prevent blepharitis and the glueing of the lids in the morning. Irritating drugs, such as silver nitrate, should not be used. When the congestion of the conjunctivia is very marked one drop of a solution of 1/4000 of the supra renal extract three times daily will afford considerable relief. If the lids are markedly edematous, warm moist compresses will be of great service.

Intense photophobia may be relieved by the instillation of a few drops of cocaine. Should the photophobia persist, always suspect some corneal involvement, and the instillation of one per cent. solution of the active principle of belladonna is indicated. The catarrhal symptoms should be combatted. The nose should receive a daily spray of boric acid solution. This greatly aids in the prevention of any inflammation and subsequent obstruction in the lacrymal sac. Other conditions must be met as they arise.

It is impossible to outline within a limited space a course of treatment for all possible complications. I wish to impress the fact, however, that owing to a large number of corneal involvement the early and apparently harmless eye symptoms should receive full consideration and immediate measures should be instituted to prevent further complications. The lids should always be kept as aseptic as possible. I have of late been using a five-per-cent. solution of argyol in every case of measles. I instill two drops daily; this is a very good non-irritating yet powerful antiseptic.

Children suffering from measles should not be allowed to read or write until the system has completely rid itself of all toxic materials and recovered from the toxemic influence of the disease. The debility affects the ocular muscles both intrinsic and extrinsic, and all possible strain should be prevented. During convalescence, great care should be exercised, as it is during this stage that most ills arise. To improve the general condition of the child should be the aim of the consulting phyisician. Most cases of serious eye complications occur during convalescence in children of strumous diathesis, tubercular, scrofulous, syphilitic and rachtic. With a vitality low and the resistance of the corneal tissue lessened, some form of keratitis is apt to develop which will leave behind some cicatricial scar and reduce the visual acuity.

The physician as a rule is not held responsible for nebulae or maculae corena, as sequelæ to measles; the defect is practically not discovered so soon and at best the general practitioner in this age of specialism is not supposed to know much—according to the opinion of the laity—about the eye, and consequently can not be held responsible. But it is sad indeed to see school children with defective vision with strabismus as a result of some neglect in the care during this apparently mild and frequent disease of childhood. In healthy and robust children a little indifference to a strict regime may be pardonable, but failure to give due warning to parents in cases of ill nourished children of strumous diathesis is morally wrong.

In addition to the local treatment the child's constitution should be built up. During the cold season, cod liver oil should be given in the stage of convalescence and continued the entire season. Nourishment of good quality and in sufficient quantity should be given to overcome the debility. When the oil cannot be used, the following mixture as an alterative and tonic is a good substitute:

Syr. ferri iodidi	m v
Liquor potassii arsenitis	m ii
Syr. hypophosph	ʒ ss
Syr. simplicis	ʒ i

This should be given from three to four times daily.

A very important remedy in the stage of convalenscence is bathing. A warm bath should be given daily; this not only facilitates desquamation and prevents the dissemination of the scales, but greatly aids in the elimination of the accumulated toxins which are the principal causal factors in the development of the anemic condition, and the debility so often met with in the postmorbillic stage.

I believe by the method of treatment outlined we shall also guard against the more serious ocular conditions, such as degeneration of the retina chorioid and optic nerve which may and do sometimes cause unilateral or bilateral partial or even total blindness.

SUDDEN DEATHS IN CHILDREN.*

By Charles Macalister, M.D., of Liverpool,
physician to the liverpool royal southern hospital.

Sudden deaths among children, although, fortunately, of comparatively rare occurrence, are relatively large in number to the total number of sudden deaths at all ages, but the conditions which occasion them are frequently of so mysterious a nature that I am afraid that to whatever facts I may be able to give authoritative expression, it will be necessary for me to add some more or less hypothetical explanations to account for them. It is owing, no doubt, to the obscurity of their nature that a discussion has been invited at this special meeting, and one hopes that the experiences which will be elicited from gentlemen representing workers, both in the clinical and in the pathological departments of medicine, will greatly help to consolidate and bring to a focus our knowledge of the subject.

I may perhaps be permitted at the very outset of my remarks to digress for one moment, and to direct attention to the fact that, in children who are the subjects of organic disease, it sometimes happens, strange as it may appear, that death may be simulated, and I have had two experiences illustrating this fact. One of these occurred during a period of residency in a hospital, when a night-sister came and reported the death of a child, and asked permission to have the body removed to the mortuary. Fortunately, the suddenness of the supposed death so surprised me that I went immediately to inspect the body, and found the child presenting such pallor, with cold and wet brow, eyes partly open, yet breathing so quietly, and the heart's action so feeble after a crisis, that the mistake did not greatly surprise me. But, although this patient recovered, there can be no doubt that children who are improperly nursed and nourished in the course of severe acute illnesses sometimes die suddenly after the crisis has been reached, or during the period of convalescence. They go out with the tide, owing to the nervous exhaustion or to some degenerative changes in the heart- muscle which have led to its enfeeblement. Faintness and giddiness are very common symptoms in children who have been the subjects of acute disease, even when they have been well cared for, and it is very noticeable in them sometimes that a pulse, which remains good while the patient is still and recumbent, becomes frequent and poor on even slight exertion, betokening a feeble and irritable heart. One could well understand the occurrence of a fatal syncope if such a case were not carefully tended and the strength maintained.

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* Read before the Society for the Study of Disease in Children, Dec 16, 1904.

A study of the excellent Reports of the Registrar-General, unfortunately, is quite unable to help us to elucidate the causes of the sudden deaths under consideration on this occasion, because, for the most part, they have been certified as cases of diseases of various kinds, and, where inquests have been held, no doubt many of them have been registered as due to congested lungs, or to whatever obvious condition has been revealed by an autopsy, or by clinical examination if the child has been seen shortly before death.

In any chapter which has been written on this subject it has been customary to classify the cases as being ascribable to syncope or asphyxia, to pulmonary, gastro-intestinal, nervous, and other rarer causes; but, while recognizing that these may be convenient headings under which to introduce the matter, it must also be recognized that sudden deaths among children are not infrequently due to certain toxic conditions, which it would be difficult to group under any particular system because they tend to affect several, the fatal issue sometimes being put down to gastro-intestinal, at others to pulmonary or nervous, disorders, according to the symptoms which had prevailed beforehand.

My chief reference will be to this class of cases, which has been familiar to me during a considerable number of years in connection with some institutions devoted to the care and keeping of children in which I am interested.

In studying these cases one of the great difficulties to be contended with is the fact that the deaths may take place so suddenly and so unexpectedly, with such trifling premonitions, that the child is not seen by a medical man at all, as the following case well exemplifies.

Last December, while the boys of one of our Industrial Schools were having an entertainment, which had been preceded by a tea, consisting of boiled ham, with sponge cake and bread and butter, one of the little lads was noticed to be coughing a good deal in a way which was described as being rather irritating than distressing. He had previously been quite well, and it was the fact that his cough disturbed the entertainment that directed attention to him. The governor gave him some sweets, which he sucked without relief, and at last he very cheerfully went to bed and took an apple and an orange with him to compensate for the disappointment of losing the fun. Half an hour later the under matron was passing through the dormitory, and noticing the lad in bed lying very still, she went up to him, and, turning his head, found that he was dead. Some fluid escaped from his mouth. Only half an hour had elapsed since the boy left the hall, and in the meantime he had undressed and tucked himself into bed, the apple and orange which he had taken with him being found under his pillow. I, unfortunately, was not notified of the post-mortem examination, which was made by my house physician at the Royal Southern Hospital (by order of the coroner), whither the body was taken, but in his evidence at the inquest he ascribed the death to syncope. There was evidence of bronchial catarrh, but there was nothing in his larynx or windpipe. The stomach was full, and he suggested that the death had been caused by a violent fit of coughing. I should have felt disposed to consider that this death had resulted from laryngeal spasm or from some respiratory obstruction causing asphyxia, but for the circumstance that other somewhat similar cases had occurred in the same and some other schools—so frequently, indeed, that they received the appellation of "rapidly fatal institutional diseases" in a Report (subsequently published as a Blue Book) which was furnished to the Home Office concerning them about eight years ago by Dr. Sidney Coupland. Little light was thrown upon them at that time, but the general impression was that they were pneumonic in character.

At the same institution on February the 13th, 1895, a boy was brought into the sick-ward who had complained of headache to his playmates during the day, and had also been sick. Towards evening, with some suddenness, he was seized with violent vomiting and had some diarrhea. He died within three hours, after becoming in succession quite powerless, deeply livid, and unconscious. There were crepitations throughout both lungs, and the immediate cause of death was asphyxia.

At the post-mortem examination, which was held on the following day, beyond some pulmonary engorgement, nothing was found to explain his death. The temperature was not recorded.

On July the 7th, 1897, a boy, previously strong and healthy, complained of headache on going to bed at 8 P.M. At 10:30 P.M. the master in charge of the dormitory woke the boys to empty their bladders, theirs being a domintory devoted to boys who occasionally wet their beds. This lad again complained of headache, which was evidently severe, because he cried about it. In the early morning of July the 8th he complained to one of his schoolmates that he felt very weak and ill, and at 6:10 A.M. the ward monitor called the ward master, stating that he had found him kneeling by his bedside, trying to get into bed, but so weak that he could not get on to his legs, and had not power to drag himself in with his arms. After lifting him into bed, he was seen to be breathing with difficulty, unable to speak and apparently unconscious. It was observed that he had evacuated his bowels in bed during the night. He died at 7:40 A.M., cessation of the respiration anteceding that of the heart. The temperature before death was 101.6 degrees F. He looked exactly as though he had been strangled or suffocated, the whole body being intensely cyanosed everywhere, the eyes congested, and the veins of the neck turgid. The post-mortem examination revealed a very small patch of pneumonic consolidation in one of the lungs, and both lungs were much congested, a dirty brown fluid exuding from their cut surfaces. The brain and other organs presented no marked abnormality. On November the 11th, 1897, four months after the death of the boy which I have just recorded, another lad, previously perfectly well, complained of sickness on going to bed. He was thought to have a bilious attack, and some simple medicine was given by the matron. He was sick several times during the night, and had a little diarrhea, but towards morning he was thought to be sleeping quietly, and the matron kept his breakfast warm for him. Since, however, he seemed to be sleeping rather too long, she presently went to rouse him, and found that he was dead. I was hastily summoned, and there he lay curled up on his side, livid and apparently suffocated, just as the other boy had been. The body was cold excepting the abdomen, and he had evidently been dead for several hours. The coroner (with a perverseness which is detrimental to scientific investigation, and especially in a case like this, which puzzled us and alarmed us for the health of the whole institution) did not grant a post-mortem examination, and we can only assert on clinical grounds that this and the former case were probably of the same nature, due to the same cause.

I might multiply examples of this sudden and terribly fatal disease by quoting other cases which have occurred in my own practice, or which have been reported to me from various sources. I had a very similar case in the School for the Deaf and Dumb in 1893, and many have come to my knowledge as having occurred in other schools, whether for boys or for girls.

In most of the cases it has not been possible to associate the illness of these children with any obvious cause. On one occasion a drain in the school-yard was open for the repair of some flaw, but the others were unaccountable; nothing could be found in the sanitary conditions so far as drains were concerned, and the food was not apparently at fault. But I found one circumstance which aroused my suspicions and led me to recommend a radical alteration in the school hygiene, the adoption of which has apparently been followed by beneficial results, not only with respect to sudden deaths, but also in the general health of the institution. I refer to the methods of bathing the children.

There were two hundred boys in the school in which the fatal cases which I have recited occurred, and once a week they got a bath, all being bathed on the same day in a plunge bath, containing about three thousand gallons of water which was heated to 90 degrees F. by means of steam. The boys were bathed in batches, those suffering from skin or ear troubles constituting the last batch.

Imagine, gentlemen, the state of that water after being used by even a fourth of the total number of lads—the horribly poisonous organic matter which it would contain, not to speak of the micro-organisms. Drs. Ernest Glynn and J. C. Matthews, in an investigation which they made ("On Bacteria in Public Swimming Baths"*), estimated that each bather shed about six thousand million bacteria, and that the number of organisms in this bath of 3,000 gallons would rise to ninety thousand per c.c.

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* Thompson, Yates and Johnson, Laboratory Reports, 1903.

The bathing arrangements were immediately altered, and the boys are now bathed on three days a week, every lad being washed with soap and water before entering the plunge, and it is very suggestive that whereas the death rate in the school had during the previous five years averaged 2.8 per cent. and only one year had passed without some deaths, which were mostly put down to pneumonia, no deaths occurred for four years and none from diseases of the rapidly fatal type, until the one which I quoted as having occurred a year ago, the cause of which was never ascertained.

I suspect very strongly that the toxin which causes these sudden deaths poisons the respiratory centre, and that the effects upon the lungs, which are noted sometimes as being simply engorged and edematous, at others as presenting perhaps a small pneumonic patch, are not necessarily primary causes of death at all.

I would like to pursue this subject by referring to some cases of toxemia resulting from sewer-gas poisoning in schools, but since none of them were fatal, I fear that I must refrain from enlarging upon an interesting matter and proceed with the material for this discussion. One of the most distressing types of sudden death is that which occurs in infants having all the appearance of robust health, and although a rare event, not a few cases have been recorded. In 1894 Dr. Harris* of Birkenhead spoke at the Medical Institution in Liverpool, concerning the appalling suddenness of the death of a healthy child, aged 5 months, a well-cared-for, well-nursed, closely-looked-after baby, which had no previous ailments. On the day of its death he had been sent for because the child had had a crying night and seemed in pain. Its temperature, pulse, and respirations were normal; the lungs, heart, and other viscera right; the abdomen slightly tender to touch, but without tumefaction; urine said to be scanty. Dr. Harris diagnosed intestinal irritation, and ordered a dose of castor oil at once, and five drops of sweet spirits of nitre occasionally during the day. The bowels were copiously moved, and in the afternoon the child was reported as about himself again. At five minutes to six in the evening it was started with a bottle by its mother, and left taking it on the head nurse's knee quite as usual. At two minutes to six the nurse noticed a change, signalled for the mother, who, coming up at once, saw that it was death.

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* Liverpool Medico-Chirurgical Journal, 1894.

There was no choking, cough, or struggle, and the face was quite pale. The post-mortem revealed nothing wrong with the viscera. The brain was not examined. Dr. Harris said death was from the heart, there was not a trace of asphyxia in it, and he asked the question, "Why should a healthy heart stop without a moment's warning." I think the only rational explanation of a case such as this is the one advanced by Dr. Buzzard about twenty-three years ago, when, in speaking of a rare case of infantile paralysis, in which the face on one side was implicated, he suggested that this affection of the facial muscles was uncommon, because if the nucleus of the seventh was involved, that of the vagus would probably be also affected, and sudden death result. One cannot here enter upon a dissertation concerning infantile paralysis, but the feeling is growing that it results from a toxin the nature and source of which are not at present understood. The fact that instances have been recorded where two children in a family have been simultaneously affected is suggestive, and it seems probable that we shall have to look for some flaw in nursery hygiene to explain this curious and selective poison.

These, gentlemen, are examples of what I mean by rapidly fatal diseases resulting directly from toxic influences, and no doubt there are many others which might be classed under this heading, although they are more evidently associated with infective processes, if not with organic changes in the viscera. We must not forget in this relation the rapidly fatal cases of scarlatina, where the patient dies overwhelmed with the poison, and that occasionally the same event occurs in measles, quite apart from the results of pulmonary involvement. I remember seeing such a case in an adult, a lady who caught the infection from her infant. She had only felt really ill for about twenty-four hours, although she must have been suffering for a few days, because she was covered with rash. On my arrival at the house, she was just dying (having become suddenly worse) from hyperpyrexia, the temperature in the axilla being over 109 degrees F.

In these septic fevers sudden death occasionally results from hemorrhage from the stomach, which comes from small pinpoint or pore-like ulcers in the mucosa, which can be seen, if formalin be injected into the stomach immediately after death has taken place so as to prevent post-mortem digestion. These ulcers appear to be embolic, and are usually derived from some local septic focus. I have seen one example in a case of measles, complicated by septic epiphysitis with involvement of the knee-joint where this profuse and unexpected hemorrhage from the stomach took place, and, being uncontrollable, was the cause of death.

There is another hemorrhagic condition which is worthy of note here, because it is quite distinctly a cause of sudden and unexpected death in infants and children; I refer to those somewhat rare cases where after an illness of only a few hours, generally characteristized by diarrhea and vomiting, followed by marked lividity and collapse, and often by the appearance of petechiæ, or bruise-like markings in the skin, the child dies, and the post-mortem examination reveals hemorrhages into the suprarenal bodies; I have seen an instance of this disease, and several have been reported.* Perfectly healthy and robust children are apt to be attacked and die in the most unexpected way. The histories of their cases remind one of the toxic diseases which were related at the commencement of this paper, and no doubt they result from poisons of a similar type; indeed, I omitted to mention in connection with the second case which I quoted that almost immediately after the child died another lad had a feverish attack, accompanied by headache and vomiting, and quickly followed by purpura and thrombosis in the veins of both legs, which rendered him ill for a prolonged period.

I am disposed to believe that some volatile sewer product which gravely poisons the blood may sometimes cause these types of disease, or some poisons of similar character derived from other organic sources.

Before leaving the subject of the toxic and septic diseases which are associated with hemorrhage, I must mention one other case where, in a little boy convalescent from scarlatina, so well that he was able to sit up and play with his toys, life was speedily ended by bleeding which took place from a small sinus in the neck,

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**E. g.* "Some Cases of Hemorrhage into the Skin and Suprarenal Capsules," by Percy S. Blaker, M.R.C.S., and Bernard E. G. Pasley, M.R.C.S., etc., *British Medical Journal,* 1901.

which had resulted from a superficial incision into a periglandular abscess. Colliquative necrosis had taken place unsuspectedly into the carotid artery, and a tremendous hemorrhage resulted which rendered him unconscious, and he subsequently died in consequence.*

Besides the sudden deaths which take place in scarlet fever and measles, I must simply mention in passing that similar events have taken place in typhoid fever in children, especially where the disease has been overlooked or mistaken for simple diarrhea, or some unimportant febrile disturbance. Dr. J. Pearson Irvine, in a paper which he published in the *Lancet* of November, 1877, records a number of cases of sudden death in young children, most of whom were brought in dead in Charing Cross Hospital, and among them were instances in which the pathological appearances indicated that the children had been suffering from enteric fever. Another point which should always be inquired into when sudden dissolution takes place is the possibility of an antecedent sore throat or other indication of diphtheria. I well remember a boy friend of my own dying suddenly after making some effort when he was recovering from what was taken to be a trivial illness, which proved to have been a diphtheria which had occasioned a degeneration and dilatation of his heart-muscle. Another striking case of the same description is recorded by Dr. George Carpenter, in Vol. IV of the "Reports of the Society for the Study of Disease in Children," pp. 127-131, where a girl, aged 7 years, died suddenly from an uncomplicated myocarditis, which probably resulted from an undetected diphtheria.

Fulminating smallpox will rapidly kill children as it does adults. A boy was brought into the Stanley Hospital many years ago, when I was a physician there, in a condition of severe illness, the nature of which was not quite apparent in the out-patient room, but he was sent up to a small ward for observation. The nurse who was attending him left the room for a moment, and, on her return was amazed to find that he had died quite suddenly. The house physician, who alone had seen him, then discovered that there was a rash on the lower part of the abdomen, and he expressed the opinion that the case might be one of malignant scarlatina. No doubt it was an example of the early roseola distributed over the lower abdominal inguinal regions, which is seen in some cases of severe smallpox, for thirteen days afterwards the nurse who had attended him and several others went down with that disease.

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* Recorded in Pendlebury Abstracts, 1885.

Varicella is another disease which, although so unimportant in general, has its serious aspects. Varicella gangrenosa is a very rare condition associated with necrosis of considerable cutaneous areas. I have seen three cases of it, one under the care of Dr. Ashby, when I was house physician at the Children's Hospital in Pendlebury, and the two others in the out-patient room of the Liverpool Royal Southern Hospital; each of these children died quite suddenly of cardiac failure, the result probably of exhaustion. It seems only liable to occur in weakly children or in those who are already the subjects of tuberculosis.

I am afraid, gentlemen, that in permitting me to open this discussion, in the section which refers to organic diseases, you have afforded me so wide a scope that it would weary you were I to deal with the subjects in a very exhaustive way. I have spoken of the toxic and septic diseases at some length because a series of them have come my way, and collective information is sometimes useful, and I shall leave others to relate their experiences regarding sudden deaths connected with the circulatory, respiratory, and the systemic organs, but in speaking of sudden deaths in children who are subjects of diseases presenting well-marked structural changes in the organs, I shall be as brief as possible.

Heart disease in children has not often in my experience tended to cause sudden death. Isolated cases have occurred, and they have generally been in cases of mitral diseases. I cannot say that in any of these cases the death has been unexpected, because almost invariably the children have been bedridden and actually suffering from the results of the disease. There is one case, however, always in my memory which has impressed me with the necessity for carefully watching cardiac cases to which digitalis is being administered. It was in a little girl about 8 years old, suffering from mitral disease, who had been under treatment for some time, and had improved greatly. I visited her late one night when making my rounds as a house physician, and while speaking to her, she suddenly cried out that she was was dying, stood up in her cot and fell down dead. At the post-mortem examination neither ante-mortem clotting nor embolism was discovered, but the ventricle was firmly contracted, and I believe that digitalis, which she had been taking for some time, was probably responsible for it. I have no notes of this case and am speaking from memory concerning it, but the tragic circumstances connected with her death impressed me in a way which renders my recollections of the facts very vivid. It is surprising that the myocarditis which is present to a greater or lesser degree in some cases of acute rheumatism does not cause sudden death in children. The heart affection hardly ever produces symptoms during the course of the fever, but I recently had one boy, aged 12 years, under my care, whose condition gave me great anxiety on account of the irregularity and enfeebleness of his heart's action, with corresponding weakness of the pulse, and impoverishment of the first sound. He was exceedingly breathless on the smallest exertion and tended to faint, so that he had to be kept carefully recumbent. I had no doubt that a serious myocarditis complicated an endocarditis which was manifestly present, but he recovered at last, so far as his immediate condition was concerned, permanent valvular disease resulting from the endocarditis. My impression is that myocarditis is a very dangerous condition, and one which, if extensive, would be very liable to cause sudden death; but as I have said, it must be a rare cause, so far as its connection with acute rheumatism is concerned. In infants congenital heart-disease is a distinct cause of sudden death, if not shortly after birth, within a few months, the symptoms preceding the death often being of a convulsive nature. In older children death is not usually sudden, and in consequence it is fairly common for it to take place in the hospital wards.

Regarding diseases of the respiratory organs, I do not propose to dwell upon the subject of laryngismus stridulus, which, being a spasmodic affection, may fairly be dealt with in connection with functional disorders causing sudden death. There are just three conditions to bear prominently in mind with reference to this system, viz., pulmonary collapse, pulmonary inflammation, and pleurisy. Collapse of the lung is a subject of considerable importance in connection with the so-called death from over-lying, and there is little doubt that some cases which have been ascribed to carelessness and drunkenness have been due to acute congestive conditions with catarrhal secretion and collapse. Brouardel, in his excellent book on "Death and Sudden Death," directs attention to this point and to the necessity for carefully distinguishing these cases lest a mistake should give rise to the assumption that criminal neglect or intent had to do with the case. Infants in a moribund condition are not infrequently brought to the hospital, livid and gasping from this cause, after illness of only a few hours' duration. In wasting and exhausting diseases this same cause of sudden death in infants is of course common enough, but is not one of the unexpected events in these cases. In pleurisy the pain may be sufficient to cause collapse and death, but if an effusion takes place rapidly in a case of acute pleurisy the respiratory distress becomes intense, practically from the collapse of the lung. I recollect seeing a child which was dying after only a few hours' illness from a pleurisy complicating post-scarlatinal nephritis. On withdrawing a small effusion which had taken place, the relief was immediate and permanent.

Regarding pneumonia as a cause of sudden death, excepting in the catarrhal types, it is not usual even in young children, but it certainly occurs and may prove rapidly fatal.

I shall not take up time by dwelling upon the nervous, alimentary, urinary, and cutaneous conditions, nor yet the syphilitic disorders which occasion sudden death; they are mostly well known and I mention them only in case they may bring to mind among those present cases which may be recorded in connection with the subject in hand.

THE TREATMENT OF ACUTE ENTERO-COLITIS.

By J. W. Scott, M.D., of Houston, Texas.

The first indication in the treatment of acute entero-colitis is to empty the stomach and intestines. The stomach can be emptied by allowing the child to drink freely of warm water to which a little salt has been added, or by means of the stomach tube. The former method, when effective, is preferable, in that it is much less disagreeable to the patient, and meets with less opposition from the family. When, however, it fails to empty the stomach thoroughly, which fact is made known by the unusual persistence of the nausea and vomiting, the stomach tube should be used.

The intestines can be cleared of their contents by means of a brisk purgative—either calomel or castor oil. Calomel has the advantage of being easily administered, and not easily vomited. It also acts as an antiseptic, and hinders to a certain extent the further development of pathogenic micro-organisms. Castor oil is quick in its work and has a soothing effect upon the inflamed mucous membrane. In the great majority of cases, especially in those with an irritable stomach, I prefer the use of calomel. This initial purgation should be thorough; because, in addition to removing all irritating matter from the intestine, it sweeps out many bacilli and their toxins.

The bowels having been emptied, it is an almost universal custom to give some astringent and one of the intestinal antiseptics. As for the astringents, such as tannic acid, catechu, kino, etc., I believe they do more harm than good. They do harm by checking and deranging the natural secretions of the upper portion of the alimentary tract, and they do no good because they are decomposed and lose their astringent power before reaching that portion of the bowels where the main pathological lesions exist.

Those astringents, like tannigen, which are supposed to pass unchanged through the stomach and become decomposed gradually in the intestine, have been proven by clinical experience to be of no particular value. As for the so-called intestinal antiseptics, among which may be mentioned salol, salicylate of soda, naphthol, and the various salts of bismuth, I am unable to see what benefit can result from their use. They disorder the stomach, depress the action of the heart, and irritate the kidneys, whose functional activity it is so important to conserve.

It should further be remembered that there are groups of bacteria in the intestinal canal which are not pathogenic, but, on the other hand, are necessary to our well-being. For instance, food stuffs are prevented from undergoing putrefaction by the fermentation of the carbohydrates caused by the bacillus lactis aerogenes and the bacillus coli comunis. These organisms, therefore, protect the system from the auto-infection which would result from putrefaction in the small intestine. Besides this, they kill many pathogenic bacteria, which are taken in by the mouth, and pass unharmed through the stomach. What good, therefore, can result from intestinal antiseptics when, if effective, they destroy not only disease-producing germs, but also those essential to health? Purgation, particularly with calomel, is the only rational method of disinfecting the intestinal canal; because, in addition to emptying the bowel, it stimulates the flow of bile, which is nature's antiseptic, and which is destructive to pathogenic bacteria only. For this reason, in entero-colitis, especially in those cases attended with much fermentation, a mild laxative dose of calomel every three or four days will prove of distinct advantage to the patient. None of the intestinal antiseptics has been so popular with the profession as bismuth, which I believe is prescribed by all physicians at some time during the course of an entero-colitis. Such, at any rate, has been my practice, although I have never observed any benefit from the administration. As an antiseptic, it is the least effective, but the least harmful of its class. As an astringent, it has but slight, if any, power. In fact, long-continued use of bismuth in large doses will frequently prolong a diarrhea instead of checking it. After the stomach and bowels have been emptied, only one remedy has, in my experience, been of much service, and that is opium, which is to be given with great care. Its use is indicated to control the bowels when moving excessively, to relieve severe pain and tenesmus, and to procure the necessary amount of sleep. Of the various preparations I prefer the camphorated or deodorized tincture. Small doses, frequently repeated, until the desired result is accomplished, constitute the best method of administration. Practically every medicine in the pharmacopeia has been at some time recommended in the treatment of acute entero-colitis, which is the very best proof that no medicine has much, if any, effect upon its course of duration. There are other remedial measures, however, not of a medicinal character, which will always prove beneficial.

In the first place, the patient must be kept absolutely quiet. The treatment of any inflamed organ is to put it at rest. This is just as true of an inflamed bowel as it is of an inflamed knee-joint. In order to procure rest for the bowel, it is of prime importance to have the entire muscular system at repose. Nothing diminishes peristalsis so much as complete relaxation of all the muscles. This is amply proven by the fact that the bowels move less frequently at night, when the patient is asleep, than during the day. I believe children with entero-colitis are allowed to move about too much, and they are handled too frequently by sympathetic relatives, who, in their great zeal to be constantly doing something, scarcely allow the patient any time to be quiet. A child with this complaint should be put to bed in a well-ventilated room, and kept there. When necessary to change its position for any purpose, it should be lifted and not be allowed to move itself. In addition to lessening peristalsis, this relaxation of the muscular system saves the child's strength, a point of vital importance in the treatment of the disease. An abdominal bandage is also of great service in the management of these cases. It acts as a splint to the underlying muscles, and thereby helps to keep the inflamed bowel at rest. It also keeps the skin warm and active, serving practically the same purpose the jacket does in pneumonia. The bandage should cover the entire abdomen. It is best made from some material that is soft, yielding, elastic, and capable of being snugly adjusted to the parts.

The kidneys and skin should be stimulated to increase activity, and thus relieve the bowel of a certain portion of its work. The kidney, skin, and intestines are the main emunctories of the body, and when either is inflamed, the other two must be called upon to assist and to functionate for the diseased organ. For instance, in Bright's disease we stimulate the skin and bowels. So in entero-colitis we should stimulate the kidneys and skin.

To increase the activity of the kidneys, I know of nothing better than drinking freely of ordinary pure water. If desired, some of the alkaline mineral waters may be used. To stimulate the skin, warm baths can be given at least once a day, preferably in the evening, when the patient's temperature is usually at its highest point. Cold baths are recommended by practically all of the authorities, but, according to my experience, the warm bath gives far better results; for it not only reduces the patient's temperature, but is unattended with shock, is more cleansing to the skin, and is conducive to a free flow of perspiration.

Another measure of great importance in the treatment of entero-colitis is irritation of the colon, which can be done once or twice daily. Particular pains must be taken to prevent any over-distention of the inflamed intestine, for the stretching of its walls can only result in harm to the patient. The bag of the syringe should not be more than two feet above the child's body. Various medicinal solutions have been recommended for use, but the majority of physicians prefer the normal salt solution at a temperature of about 115 degrees. These irrigations serve to wash away irritating discharges, and to keep the lower bowel cleansed. As a portion of the water is absorbed by the depleted blood vessels, they also serve to stimulate the heart, to dilute the toxins circulating in the blood, and finally to eliminate them through the kidneys and skin.

Now, in conclusion, a few words as to diet. In the beginning of entero-colitis, there is usually great irritability of the stomach. While this continues, that organ must have complete rest. Not even water is allowed. If the vomiting, however, persists for several hours, water must be given by the rectum to compensate in measure for the loss of the body fluids through the bowels. When the vomiting subsides, the patient can gradually begin to drink boiled or one of the alkaline waters. A little later, as the stomach becomes still more tolerant, panopeptone, or some such nutritive elixir, can be regularly administered, but no other food of any description should be allowed until all acute manifestations of the disease have passed. By acute manifestations I mean tympany, watery discharges and high temperature. When these symptoms have subsided, thin gruels and meat juices can be given with safety, and, as the patient convalesces, the normal diet may by slow degrees be resumed. Great care, however, must be exercised along this line, for fear of relapses, which are very common in this complaint. I believe the most frequent mistake made in treating entero-colitis is improper feeding. Undigested foods are given when the digestive powers are in complete abeyance. Instead of nourishing the patient, such foods irritate the stomach, increase peristalsis, and ultimately ferment and decompose, thus adding to the existing auto-infection. The nearer the stomach and intestines are kept empty, the nearer they approximate a state of physiological rest, which, in entero-colitis, is the prime object of all well-directed treatment.

NEW YORK ACADEMY OF MEDICINE.

ORTHOPEDIC SECTION.

Meeting of January 20, 1905. DR. HOMER GIBNEY, Chairman.

ILLUSTRATION CASE.—Dr. Homer Gibney presented the following case from his service at the Hospital for Ruptured and Crippled, with X-ray—girl—five years—admitted to hospital January 11, 1905.

Diagnosis.—Fracture right femur and old fracture of left femur. Left femur fractured two years ago. Found not to have united. Had no pain. Four days before entrance fell and had fracture of right thigh. Had no pain at entrance.

Physical examination shows fracture right thigh, anterior bowing at middle and upper thirds. Linear scar four inches long over outer side of same thigh. Also marked anterior and lateral curvature of left thigh at same level; bone, however, is very firm.

Treatment.—January 17, 1905, right leg by use of traction and local force straightened and bones got in good apposition, and put up in plaster spica, as at present. Subcutaneous osteotomy was done on the posterior half of the left femur at site of old fracture. The bone was then broken backwards and plaster spica applied to that side.

COXA VARA.—Dr. Gibney also presented a case of double coxa vara admitted by Dr. Whitman and operated on by him. Girl—four years. The progressive scissors deformity was not present—the waddle peculiar to congenital dislocation was present in this case, but the tibial curve had been corrected. Physical examination on admission showed marked evidence of rickets, waddling gait and lordosis as in double congenital hip—Trochanters above Nelaton's line both sides. Right and left legs same on measurement. Soon after admission Dr. Whitman did osteoclasis (manual) at the middle of both tibiæ—union firm, put up in plaster of Paris in over-corrected position. Firm union—deformity corrected, and the child was measured for braces which she now wears.

The Chairman said that the interesting feature of this case is that the X-ray shows the right angle deformity of both femoral necks—a rather unusual bilateral coxa vara.

Dr. Whitman said that now that the bow legs had been corrected he should proceed to treat the coxa vara with the idea of replacing the neck of each femur in the normal position, for in his opinion the deformity might later on become progressive. The character of the operation he had described on several occasions—namely, a cuneiform osteotomy at the base of the trochanter, of sufficient size to permit full abduction of the limb.

Deformity Femur.—Dr. Whitman presented an X-ray picture showing thickening, softening and slight deformity of the right femur. This illustrated so-called local osteitis deformans. The patient, a man fifty-eight years of age, had noticed slight discomfort about the thigh for twenty years. For three years this had become more troublesome. There was a slight limp, slight outward and forward bowing of the middle of the femur and one inch of shortening. No treatment other than the avoidance of over-strain seemed to be indicated.

Epiphysitis.—Dr. C. N. Dowd presented a boy who had epiphysitis of the upper end of the humerus, which healed after operation two years ago. The abscess which had followed the epiphysitis had pointed just back of the deltoid insertion. The joint had not been involved. About half the head of the humerus was removed without touching the articular surfaces. Healing was complete in about two and a half months. The speaker particularly called attention to the condition of the shoulder-joint, which was normal; also to the growth of the bone, which too, was normal.

A second case of a similar kind, which was announced on the card but which had not come to the meeting on account of whooping cough, showed also a normal joint and normal bone growth, although the interior of the head of the bone had been completely removed, leaving simply a thin hard shell. He asked the experience of the members of the Section on the effect of epiphysitis on the growth of the bone. He had seen a number of cases in which only a small shell of bone was left and in which the subsequent growth had been normal.

Dr. Dowd also presented a case of epiphysitis of the lower end of the tibia with an X-ray picture which showed a cavity in the bone leading upward from the epiphysis about an inch to the bone surface. The bone below the epiphysial line was cloudy and showed a lack of detail in the picture, but there was no evidence of involvement of the ankle-joint itself. The motion in the ankle-joint was free and not painful. The wound was practically healed. The outer shell of bone above the epiphysial line having been removed for about two inches healing had taken place in five weeks.

The speaker also presented a case of fracture of the external condyle of the humerus, admitted in September, having the ordinary appearance of such a fracture. The arm was put up in plaster in flexion; was inspected in two weeks and put in plaster again for two weeks more. He was unable to gain extension after healing had taken place. He was seen again about December 1, and the fragment could be distinctly felt;

very slightly movable, the arm was still flexed at about 90 degrees. This fragment was removed by Dr. Mathews and was found to consist of a part of the external condyle and about half the capitellum. It had rotated about 90 degrees. Motion was good after this removal. The arm was again immobilized in flexion for three and a half weeks. Motion was now nearly normal. He has been carrying a light weight on his wrist, and extension has rapidly increased in that way.

Dr. Dowd referred to a similar case which had previously been treated in the hospital, and to several which were reported by Kocher and others. He said that he had been interested in this case on more than one account, particularly from having read in one of the most recently and widely circulated systems of surgery the following statement concerning fracture of the external condyle: "The prognosis is unfavorable as the fracture lies partly within the joint and callus production and adhesion may cause permanent impairment of motion; for this reason it is important to begin passive motion as soon as possible—that is, at the end of the second week." He believed that the best way to prevent callus formation was to immobilize the arm until the fragments were firmly united, and quoted his own experience of about 50 cases with only one in which good extension did not result. On the other hand, the surgeons who advocated early passive motion were the same ones who were also removing the fragments of bone frequently because their results were so poor. He felt that it would be advisable for the Orthopedic Section to express an opinion as to the desirability of immobilizing such joints in order to prevent callus formation and thus gain a good result.

Dr. Dowd also presented a case of paralytic talipes equinovalgus, treated by the method which Dr. Whitman advised. The tendon of the extensor hallucis was divided near its insertion, carried through a hole in the scaphoid bone, the end being then brought up and sewed to the upper part of the tendon, making a firm fastening to the center and to the side of the bone.

Synarthrodesis of the astragalo-scaphoid joint was also done. A small filament of the tendon of the extensor hallucis, which was separated from the rest, was left in this patient. The foot had been kept in plaster for three months. He was now walking with a brace, which limited the plantar flexion of the ankle-joint and prevented eversion of the foot, and walked very well.

A case of fracture of the middle of the femur was also presented by Dr. Dowd with practically a perfect result. The X-ray picture showed an oblique fracture, with good apposition. A similar picture, taken after the healing, showed the position was maintained, and there was a slight callus about the fracture. The case had been treated with Buck's extension for two weeks, and then kept in plaster for five weeks. He said that he had noticed that four weeks had been suggested as a time in which bony union is firm in a child after fracture of the femur, but it did not seem to him wise to permit use of such a femur under seven or eight weeks.

Dr. Whitman said that accurate apposition and rest would assure union with the least callus formation, as illustrated by the X-ray picture of the fractured femur presented by Dr. Dowd. He had supposed that early passive motion in cases of fracture involving a joint had been employed rather to push away bone or callus that might prevent motion than with the aim of lessening its formation. Massage, after union was assured, had of course a very different object.

Dr. Whitman said, regarding Dr. Dowd's case of tendon transplantation, that it was difficult to assure firm ankylosis in children so that in doing this operation he sewed the astragalus and scaphoid with strong silk and fixed the foot in varus and slight dorsal flexion (over-correction). As soon as possible the patient was encouraged to walk about and the longer the attitude was retained, the better, in order that varus should be impressed on the foot by accommodative changes.

In Dr. Dowd's case there was slight flat foot which might be corrected by a foot plate.

Dr. Whitman said that in correcting deformities at the elbow following fracture, the attitude of complete extension was of advantage. This was best assured by a plaster bandage which included the thorax as well as the arm. Complete extension was an awkward attitude for ambulatory treatment, but was not uncomfortable if the patient remained in bed as was usual after the open operation to which he especially referred.

Dr. Myers said he thought the amount of shortening would depend upon how much of the epiphysis had been destroyed by operation or disease; the amount of motion on whether the joint was involved or not, though this rule was not absolute. These cases are quite frequent in tuberculous children following strains and the results usually much better than in the hip. The speaker remembered two cases about twelve years old now, and it would be impossible to say anything had occurred at that joint, whereas, in another the limb had been shortened at least three inches in its development. This case had undergone two scraping operations in that region, and probably most of the epiphysis had been destroyed.

Dr. Sayre said that in his experience if the disease has been so extensive as to either obliterate the epiphysis of itself or to cause it to be removed by surgical intervention there has been very material reduction in the growth of that limb. It does not at all times follow when the disease is situated in the neighborhood of the epiphysis that by removal of the diseased tissue the epiphysis is sacrificed. In those cases he thought we still had, sometimes, the same rate of growth in the leg. He had operated on an ankle in a boy a little older than the one presented this evening, scooping out the lower end of his tibia to remove a tubercular focus. At the present time the patient is a medical student, with legs of absolutely normal length. About five years ago the speaker had scooped out the head of the humerus in a girl twelve years of age. The last time he had seen the case there had been no appreciable diminution in the length of that humerus. In a good many other cases there had been very marked diminution in the growth of the bone after such operations.

In some cases of hip disease one sees a very marked atrophy of the femur, very marked shortening, although the case has been rather a mild one and the acetabulum and the tip of the femur have been very little involved, but the epiphysis evidently very much demoralized both from appearance as shown in X-ray and diminution in growth of the leg. A very much shortened femur on that side was sometimes accompanied by very excellent functional result.

Dr. Sayre said Dr. Dowd showed that case of elbow, as he understood, to get the opinion of the Section as to the result of movement of fragments soon after fracture in regard to the production of callus. It seemed that the irritation of the two extremities of broken bone was one of the surest ways of producing callus. It is certainly one of the well-recognized facts when we have non-union in fractures after a number of weeks, that we irritate the ends of the bones in all possible ways—stick needles in them—drive electric currents through them—rub them with the hands, to start up callus.

Judging from practical results he had seen, there was much freer motion in fractures of the joint, when left severely alone after fracture, placing fragments in as nearly normal position as possible, keeping them quiet to get a good union, rather than taking them down at the end of a fortnight to move them. It has been fashionable in recent years to take fractures down very soon after the injury, in a fortnight, we will say, and begin to move them, and that was the plan a number of years ago. Then it became less fashionable in this country and the doctrine of rest after replacement was preached very forcibly by a great many gentlemen. Abroad they recently have become enamored of the idea of manipulating the fragments and moving the joints very soon after fracture with the idea of preventing ankylosis.

The reason for moving these fragments in the neighborhood of the joint as given by those practising in this country was not to prevent the formation of extra callus in the joint, but to keep the joint itself limber so it would move, and the ligaments would not set up fibrous ankylosis. The idea of motion of the broken part diminishing the formation of callus was new to the speaker and he was surprised at Dr. Dowd having said that Von Bergman gave that as the ground-work of his treatment.

Dr. Fiske said he did not know of any more difficult fracture to treat than that of the external condyle of the humerus. In those cases involving joint surfaces there is generally a good deal of displacement, for that reason we have poor results due to the amount of callus which is large because it is almost impossible in some cases, to effect perfect apposition of the fragments. It seemed to the speaker that any such fracture with fragments displaced should be reduced while the patient is under an anesthetic. He said he made it a rule in attempting to effect reduction. In many cases it is impossible in spite of the greatest care in manipulating, to effect exact reduction. In most cases he placed the arm in the right angle position. In two weeks, when changing the dressing, he attempted to drop the arm 20 or 30 degrees. He thought this method eventually gave a better result than when the arm was kept in one position four or five weeks.

He said he was not in favor of early massage, but thought the joint should have twenty-eight days of absolute fixation.

Ruptured Achilles Tendon.—Dr. Fiske presented a man who, about eight days ago, attempted to perform an athletic feat by which the Achilles tendon on the left side was put under great strain. A physician called in to look at the case decided that nothing very much was the matter. Dr. Fiske, after a few days, saw the man for the first time, and discovered that he had practically complete rupture of the upper portion of the Achilles tendon, but had good function. It was a unique case. He had attempted to jump up against a wall and placed his foot against the wall. The shoe he had may have caused pressure, cutting him.

Dr. Whitman said this case brought up a point in favor of subcutaneous tenotomy in that it demonstrated how one may divide a tendon and leave the sheath to preserve continuity. He said he would fix the foot in slight equinus until the tendon had united—the calf muscle would meanwhile accommodate itself to the elongated tendon. The man, in his opinion, should not walk without support, for fear of breaking the sheath.

Dr. Sayre said a number of years ago this question of immobilization of the tendon after tenotomy occupied a great part of orthopedic literature.

Mr. Adams wrote a long work on the subject of tenotomy which received a prize, in which he proved conclusively, he thought, that it was necessary immediately to approximate the fragments after a tenotomy, in order to get union. In the Appendix he spoke of Mr. Rolfe Cox, a veterinary surgeon, who operated on race horses who had equinus. He cut the flexor perforans tendon, cut off the overgrown part of the hoof and allowed the horse to stand on his foot and run about the field at once. The horse soon recovered with a good tendon, winning a race the next year. This showed that the approximation of fragment as argued in the first part of the book, was not necessary in quadrupeds. It is not necessary, either, in bipeds. If one divided a tendon and covered the gap between the ends with a firm dressing and thus left a space to be filled in with blood it would afterward organize in a good piece of tendon. After 18 days, in rabbits, it is difficult to see with the naked eye that there has been a break. In three months one cannot detect the union under a microscope. On the contrary, if one put a tight bandage around the part with a protecting roof over the gap, and keep it there, the space would be occluded so no opportunity was allowed for effusion into the gap, and cases thus treated might result in non-union.

Dr. Ogilvy cited a case in which a heavy woman was allowed to walk in seven days after the snapping of the tendon. She could not raise herself on her toes, and the tendon was not half as strong as before rupture. This result he thought was due to the fact that she had been allowed to walk too soon.

Ankylosis Hip Joint.—Dr. H. W. Frauenthal showed a girl, aged ten, asking for suggestions, in whom both hip joints were ankylosed at right angle. Her trouble started in the right hip at three years of age. Had had all kinds of treatment. For the past three years no treatment at all. It was a case of neglect, sent to the speaker to see if anything could be done for her.

Dr. Charles Ogilvy presented a case of congenital dislocation of the hip operated on in October, 1901, by Dr. Phelps, open method. The patient was admitted six weeks before operation, during which time between six and eight pounds' weight was put on the leg. The Hoffa open operation was done except that the Duyon excavator was used. The neck of the bone had an anterior twist. The head set more perfectly in the acetabulum by having the leg rotated inwards and the leg was put in plaster, remaining three months, after which time a Phelps' hip splint was applied. This was kept on for six months, making nine months of fixation altogether, after operation, after which time the child was allowed to walk without further apparatus. The result is perfect.

Dr. Ogilvy showed another case operated on by Dr. Phelps, open method, in December, 1901. For six weeks a plaster of paris spica was applied; after that the plaster was removed and a hip brace was applied as in the other case. The brace was kept on for six months. In July the brace was removed.

On December 12, 1902, Dr. Lorenz operated on the other side. At the time of the operation he mentioned the fact of the acetabulum being particularly shallow, and said it was wiser to keep on the plaster of paris as long as possible, even if it had to be renewed—that it should be kept on for at least nine months. She was treated as he advised with the results as shown.

Dr. Whitman said that he was glad to see such good results from the open method. He thought that it should follow the Lorenz operation when that had failed. He did not think the Lorenz attitude the cause of anterior displacement ordinarily, but rather the deformity of the neck and head of the bone. In the bilateral cases shown there was slight anterior displacement on both sides. On the side in which the acetabulum was excavated there was a bony outgrowth which gave the femur a more secure support.

Dr. Whitman said that in a number of instances he had operated for this twist of the upper extremity of the head of the bone. He had opened the joint, enlarged the acetabulum when necessary and replaced the head of the bone by rotating the limb inward. Subsequently the normal relation was restored by osteotomy of the shaft of the femur. After the joint is open one can see the relation of the neck and head of the bone to the condyles of the femur, and can demonstrate that permanent replacement is impossible unless the deformity of the bone is corrected.

Dr. Sayre said he had heard an expression from Dr. Lorenz in regard to this technique. Dr. Sayre had asked him what his practice was in cases where the anterior twist of the neck of the femur is so great that when one puts the head in the acetabulum the toes are turned inward. In these, if one succeeds in placing the head in the acetabulum the foot must be turned inward and could be straightened only by subsequent osteotomy in the shaft of the femur.

Dr. Lorenz replied that this was the logical mode of procedure, but it did not seem to him to be necessary. What he was looking for was a good functional result rather than perfect anatomical replacement and in his experience he had obtained results functionally satisfactory to the patient by anterior re-position in these cases. He cited a case in which one of his colleagues had followed out partially the treatment just outlined by Dr. Whitman. When he had arrived at the stage where osteotomy should be done the parents threw up their hands at the idea of an operation and went to Vienna where the non-bloody operation was performed, with double transposition, anterior, to the great delight of the parents.

In both of the patients on whom Dr. Lorenz operated for Dr. Sayre at the New York University and Bellevue Medical College, he obtained anterior transpositions. He said that the head of the bone was not in the acetabulum—he did not pretend to have it in there—did not think it necessary to do so, but he said the children would have very excellent, useful legs the way he left them, and that was what all were anxious to have. One case was single, the other double. The "double" child walks a good deal as the "double" child did this evening. The child with "single" hip walks very excellently—runs up and downstairs with hardly a trace of limp. One can see she has not an absolute re-position when her clothes are off, and motion is slightly limited, and there is a tendency to turn the toe too much outward unless she thinks of it. Several people have guessed wrongly when asked which leg, as she ran up and down the room.

Dr. Sayre said he had a case of double congenital dislocation of the dorsum of the ilium, which he saw when the girl, now nineteen years old, was a small child.

The child fell downstairs, thrusting one leg through the banister, severely wrenching the hip. This fall converted the posterior luxation into anterior. That leg was one inch longer than the other, solid and stable, the other slipped around the dorsum of the ilium. She said: "This leg has been all well since I fell downstairs. If you can make the other as good as this, it is all I want." That was the attitude of Lorenz. Dr. Sayre said neither of the cases Lorenz had operated on for him had so good a functional and anatomical result as that of the single open operation shown this evening.

The speaker said he thought Dr. Whitman had stated the case as tersely and as exactly as possible, and he considered it the logical and sensible thing to do in the majority of these cases.

Dr. Ogilvy said he had noticed in looking over statistics of cases operated on by Dr. Lorenz, that the majority resulted in anterior displacement. In several cases he distinctly remembered, operated on by the open method, he found the head and neck of the bone twisted anteriorly. It is easily understood that if these cases, with the neck and head of the bone twisted anteriorly be treated by the Lorenz method, the head of the bone will be anterior and we will have as a result, an anterior displacement. Dr. Ogilvy asked if that were not the reason why there are so many anterior displacements, the result of the Lorenz method. Why will not internal rotation rather than outward rotation obviate this result?

PERIMAXILLARY ABSCESS.—Dr. H. C. Frauenthal presented the case of a young man who came under observation on the tenth of the month. He said he had not opened his jaw for ten days—

perimaxillary abscess. An attempt was made seven days ago to excise the abscess, which broke. The patient was admitted to hospital, for observation. Since the breaking of abscess the jaw can be opened three-eighths of an inch. Has been on soft food for twenty-one days. No temperature, no pain, no septic chills nor anything of the kind. A wisdom tooth extracted nine or ten days ago may have been the cause of the trouble.

SOCIETY FOR THE STUDY OF CHILDREN'S DISEASE.

London, January 20, 1905.

Dr. Percy G. Lewis, Chairman.

Volkman's Contracture.—Two cases of this affection were presented by Dr. F. Jaffrey. One was that of a female child two years old, and the contracture occurred in the right forearm as a result of fracture. The other was a female child seven years old, the contracture occurring under similar conditions.

Lupus of the Epiglottis.—Dr. W. H. Kelson presented a case of lupus of the epiglottis and left vocal cord occurring in a male child twelve years old. Treatment by galvano-cautery had been employed. The upper part of the epiglottis was lacking, and red apaules covered the stump, as well as the left vocal cord, the anterior commissure and ventricular bands. The patient's sputa had been examined, but no tubercule bacilli had been found. There was no history of syphilis.

Aortis Stenosis.—Dr. L. G. Guthrie presented the case of a female child twelve years old, which he diagnosed as an aortic disease, with the belief that some congenital malformation might be present about the aortic valves. A pronouncedly rheumatic condition was evident in the patient. This same case had been brought to the notice of the Society in December, 1903, and on both occasions various differences of opinion were elicited.

Double Aortic Disease.—Dr. A. Morison presented a case of double aortic disease in a male child of ten years, who also had mitral regurgitation. Some history of rheumatism was given.

Congenital Pulmonary Stenosis.—Dr. George Carpenter presented the case of a child suffering from this affection, who also gave some evidence of a patent septum ventriculum.

Peno-Scrotal Hypospadias.—Mr. Donald Armour presented the case of a male child four years old, for discussion as to the most desirable form of operative treatment, and the age at which it had best be done.

Generalized Lichen Planus.—Mr. G. Pernat presented the case of a male child six years old, suffering from generalized lichen planus of three months' standing. A tower skull ptosis was present, with absence of upper movements of the eyes, and a palate markedly arched. Mr. Pernat also presented a case of circinate gyrate erythema multiforme.

Congenital Multiple Occlusion of the Small Intestine.—Dr. J. G. Emmanuel showed a specimen from a child which died at nine days. It was a seven months' infant, and vomited from birth, but passed no stool. An enema secured a copious evacuation of meconium. Atresia of the bowel at the duodenojejunal juncture was complete, the duodenum being hypertrophied and dilated until it exceeded the stomach in size. The jejunum was entirely lacking for about half an inch in two separate places. Five complete occlusions of the gut by annular constrictions in the jejunum and upper part of the ileum were observed.

HEMOPHILIA.—Dr. G. E. C. Pritchard presented the case of a female child six years old. Since infancy the child had suffered from repeated attacks of epistaxis. Hemiphilia was hereditary in the male line for two generations.

FOREIGN BODY IN .THE ESOPHAGUS PERFORATING THE TRACHEA.—Mr. A. T. Marshall presented this specimen, taken from a post mortem child seven months old in whom it had occasioned consolidation of the right lung, ulceration into the trachea and pus in esophagus and trachea.

EDITORIAL

SURGICAL AND ABDOMINAL TUBERCULOSIS IN CHILDREN

The question of tuberculosis among children came up for discussion before the managers of the Metropolitan Asylums District on April 15, and Sir William Broadbent delivered an address in which he spoke particularly of the obligation which rested upon the public in the matter of caring adequately for the children of the poor who are afflicted with tuberculous disease of the bones.

He made the assertion that this type of the disease was particularly susceptible to improvement by the open air treatment, and the result of our own experiments at Coney Island, as shown by Linsey Williams and J. Winter Brannan, would seem to bear out the English physician in this respect. He furthermore stated that the treatment of such cases in the ordinary wards of public hospitals was a waste of time and energy, since the patients treated did not receive any considerable benefit, and merely occupied the space and time which might and should be devoted to other diseases more adapted to cure by such treatment. In addition to the patients thus misplaced in the public wards there are a large number of them remaining in their homes and constituting a heavy expense in households with scanty resources, without any prospect of recovery. These same children, if provided with a proper course of treatment, might be restored to health in a comparatively short time, and cease to be a source of anxiety and expense to their overburdened families.

This problem seems to have been most satisfactorily met in France, where at several places in the vicinity of Paris, at Hendaye in the south of France, at St. Pol in the north and at Berck on the English Channel sanitaria are maintained for the open air treatment of children with surgical tuberculosis. The surgeon in charge of the last mentioned place considers that once the disease is thoroughly established a three years' treatment is necessary in order to eradicate it; but the sanitaria are open not only to those with such pronounced cases, but also to those who show a tendency to the disease or seem to be threatened with it, and these children of course can be discharged with safety much earlier. This same physician, Dr. Ménard has estimated that every large city in which a "slum" population exists, should maintain for every million inhabitants 1,000 beds for children, in seaside hospitals if possible, since not only open air but especially sea air seems to have a beneficial effect upon these cases.

Up to the present time the etiology of surgical and abdominal tuberculosis is not altogether settled in the opinions of scientists. In a recent report to the German Imperial Health Department Kossel, Weber and Heuss confirm the statement of Prof. Koch that tubercle bacilli from a human source are easily distinguished from those from a bovine source. They examined specimens from 56 patients, men, women and children, and found the bovine bacilli in only 6 cases, all in children under seven years old, and five of them showing evidence that the infection was either confined to, or at least began with the intestines or mesenteric glands. The sixth case was one of miliary tuberculosis. In all 18 children were examined, and the percentage of those showing the bovine bacilli together with the seat of the disease which suggests milk as the vehicle of infection, would seem to emphasize the necessity of effectual protective measures aimed at impure milk. That it is not easy to frame measures which are at once practicable and effectual is easily recognized, but the difficulty of the task is no excuse for its neglect. With an assurance of pure milk supply and with a provision for enough beds in seaside hospitals for the open air treatment of surgical tuberculosis cases, the children of the city would have a fair chance of resisting the white plague. Such conditions in their completeness may not be an ideal easily obtained, but one that can at least be approximated.

UNDERFED CHILDREN IN ENGLAND.

In view of the interest recently awakened in this city by the assertion of Mr. Robert Hunter that great numbers of children daily go to school without any breakfast and suffer in many ways from underfeeding, a statement which might have been more effective if it had been possible to secure approximately accurate statistics, a recent letter in the *British Medical Journal* from Leeds where in a limited area some definite facts have been discovered and some definite results accomplished, may prove somewhat enlightening. In this town the matter has been investigated by the Educational Committee who discovered at the beginning of the winter no less than 6,720 underfed children in attendance at the elementary schools. The matter was taken up by the Children's Relief Fund, and dinners furnished to over 25,000 children in one week. Many of the children's parents were out of work, and of these parents only about 12 per cent. were of the "less deserving class."

The most interesting and convincing phase of this work is found in the investigations of Dr. William Hall a retired physician of Leeds. Dr. Hall has taken every precaution to insure correct values in the results of his investigations and has included in them the feeding of the younger children and infants and of the mothers during pregnancy and lactation. He has examined carefully 3,000 children of the locality and arrived at some interesting conclusions.

A comparison of groups of Jewish and Gentile children living in practically identical conditions of locality and poverty showed a distinct advantage in physical development for the Jew. The Jewish child is taller, heavier, possessed of better teeth, less rickety and less apt to be a mouth breather. Dr. Hall believes that this difference is due to the character of nourishment supplied before and after birth. In the class where his researches were carried on he found that, other things being equal, the pregnant Jewess was better fed than her Gentile sister, and seldom unable to nurse her baby, whereas "bottle babies" are found with comparative frequency among the Gentile population. Thus the Jewish baby gets a better start, and after it is weaned its dietary is more rational than that of the Gentile child in the same state of poverty. The latter is compelled to subsist upon "white bread, tea, badly cooked fish, tinned meat and pickles." Small wonder that they are found "on the edge of scurvy." On the other hand the same amount of money will be expended for the Jewish child in procuring bread of wheat and rye mixed, plenty of sugar and usually milk for tea or cocoa. The mothers club together to buy good fish, use vegetables freely and manage to obtain eggs for the children. The consequent superiority of Jewish physique discovered by Dr. Hall should convince the thoughtful that the nourishment of its children is a matter of no small moment to any nation. It would be interesting to discover whether these same differences in diet obtain in America to any extent.

The most encouraging aspect of Dr. Hall's statistics is the prompt response of these half-starved mites to his "treatment," treatment which consisted simply in securing to each child one adequate meal a day. In two weeks children of seven and eight years of age gained at a rate that if continued would have averaged nearly thirty pounds a year for each. This astonishing increase upon the normal gain at that age is accounted for, in Dr. Hall's opinion, by the fact that the tissues of these children, like those of a convalescent, are ready to take up nourishment with avidity.

Later two meals a day were served them, but even then at a cost of about twelve cents. They show unmistakable signs of a greatly improved general condition, and the writer of the letter justly points out that one cannot fail to be hopefully impressed with this evidence that "children who have made a bad start, and who are living on the edge of scurvy, may be, one may really say, rescued" at so trifling a cost.

ABSTRACTS

Incontinence of Feces in Children.—Three instances of this rather rare condition, of which only about a dozen cases are on record, are reported by M. Ostheimer (Univ. Penn. Med. Bull., February, 1905) as occurring in boys ranging from four and a half to ten years. In six months upon nutritious food, tonics, and fresh air, he made complete recovery. The other two boys were otherwise well, with the exception of a general nervousness in one of them. The latter after a time also developed paroxysms of pain with micturition, and often passed bloody urine. After removal of a vesical calculus, he became perfectly well. The author found the best results attended the administration of strychnine and atropine, up to one-tenth of a grain of each daily. Relapses are common and must always be treated in the same manner. Tonics and good food, together with plenty of fresh air, are very important.

Standardized Gruels.—H. D. Chapin (Med. Rec., February 18, 1905) says that with the increased knowledge that has resulted from a careful study of the use of gruels in infant feeding it has become recognized that they have other values than as attenuants of the curd of the cow's milk. They may often be employed to economize the energy of the body that is being used in the effort to prepare food for assimilation, and by taking advantage of this fact it is frequently possible to keep the body well nourished on a quantity of food much smaller than is theoretically indicated. It is highly desirable, therefore, that there should be some uniform standards for use in preparing gruels, and that their food values and possibilities should become better known. With this object in view the author had made gruels containing varying amounts of pearl barley, prepared barley flour, wheat flour, and rolled or flaked oats, which were then assayed to determine their composition in order to show the relative properties of tissue-building and heat and energy-producing elements. The tables obtained are reproduced, as well as others showing simple methods of preparing gruels of any desired strength.

Relation of Epilepsy to Convulsions in Children.—Moon (Lancet, Lond.) urges that a serious view be taken of all convulsions occurring in infancy, and says that we are justified in supposing that even a single convulsion in childhood will end with itself and have no further evil influence on the life of the child. For most of the cases which arise in connection with an extrinsic cause also have a history of heridity or alcoholism in the parents, which are both predisposing causes of epilepsy. Even where there is no such history, and it is assumed that a peripheral irritation is adequate in itself to produce a convulsion in a perfectly normal brain, the mere fact of the convulsions being often repeated makes the brain cease to be normal and creates a distinct pathologic basis for the production of epilepsy. It is impossible to give the precise relation of such convulsions to epilepsy, but Moon believes that a much greater difference is made between these two affections than the facts seem to warrant.

Scarlet Fever.—SEIBERT (N. Y. Med. Journ.) treats extensively of this condition. Among his conclusions are: (1) It is endemic in New York City; (2) most common among school-children; (3) chief centers for contagion are the schools; (4) direct contact is necessary for infection.

Under the head of treatment he uses a 5 or 10 per cent. ichthyol-lanolin ointment applied to the entire cutaneous expanse two to four times daily and rubbed in well; and disinfects the pharynx with a 50 per cent. resorcin alcohol solution; as soon as the throat symptoms appear the patient is placed in the intubation position, a plug of absorbent cotton saturated with above solution is quickly passed into the naso-pharynx on one side of the uvula, held there a few seconds, and same upon opposite side, when surface of mucous membrane turns milky-white. Repeat until this result is obtained; these applications are to be made two or more times daily, according to the severity of the case, until the throat is free from exudate. Favorable amelioration of symptoms is noted in a few hours.

Fischer (J. A. M. A.) sums up the prophylactic measures in infantile tuberculosis as follows: (1) Insist on each infant being breast-fed; (2) if maternal nursing is impossible, secure wet-nurse; partially bottle-feeding both infants if necessary. The secret of the vitality and endurance of the tenement-house hordes is that they are, or have been, breast-fed. The two prophylactic measures are (1) breast-milk, (2) fresh air and sunshine.

Pneumonia in Infants.—NORTHUPP (Med. Record, N. Y.) summarizes the treatment as follows: (1) Castor oil to clear the field; (2) fresh air, cool and flowing; it reddens the blood, stimulates the heart, improves digestion, quiets restlessness, and combats toxemia; (3) keep baby's feet warm and its head cool; (4) plenty of water inside and out; (5) quiet and rest; (6) correct feeding to prevent fermentation and gas formation; (7) antipyretics, water only; (8) heart stimulants, fresh air, hot foot-baths, and relief of typmpany; medicinal stimulants, whiskey and strychnine.

Eneuresis.—Rey (Berliner klin. Woch.) insists upon the necessity for making a urinalysis in this condition, stating that the most frequent causes are: (1) Infection with the colon bacillus; (2) an excess of ammonia salts; (3) an excess of phospates; (4) or an excess of uric acid, and suggests salol as the best drug for meeting these indications.

Pertussis.—Passalacqua (Med. Orientale) injected 1,000 units of diphtheria antitoxin in cases of whooping-cough, and claims improvement in seven cases; broncho-pneumonia had developed; these were also improved.

Cholera Infantum.—Sterrett says there are two important conditions to be met: (1) Cleanse and asepticise the alimentary canal; (2) determine the flow of blood to the periphery. He uses zinc sulpho-carbolate for the antiseptic, and a granule of atropia sulphate, gr. 1-250, for each year of the child's age, to twenty-four teaspoonfuls of water, giving a teaspoonful of the solution every fifteen or thirty minutes, until the skin is well reddened. If there is much depression, he adds strychnia arseniate, in the very young, brucine. If there be much pain, add codeia sulphate, at the same time practising the usual hygiene management and after-treatment.

Diet After the Age of One Year.—Griffith advises that the infant should be weaned at from the age of ten to twelve months. When possible this should be accomplished gradually, only one bottle of food being given at first, and this of a strength less than mother's milk, thus enabling the child to accustom itself to the new food. The number of bottles and the strength of the mixture are increased gradually until at the age of a year the food should consist of milk slightly diluted. The child should be weighed systematically twice a week during the weaning, in order that no undiscovered loss of weight takes place. After the child has been weaned entirely and has become accustomed to the new artificial food, it is well to add to the food a concentrated amylaceous substance such as barley jelly or arrowroot jelly. The proportion of two rounded teaspoonfuls of barley or arrowroot to a pint of water, cooked in a double boiler for ten or fifteen minutes, makes the proper strength. This may be added to the food in the proportion first of one and later of several teaspoonfuls to each bottle, the addition to be made while the cereal substance is still hot. The number of feedings during this period has been reduced from three hours to three and a half or four hours, depending on the requirements and habits of the child. The amount of nourishment should be from 8 to 10 ounces at a feeding.

Deaths from Anesthesia in Childhood.—BLUMFIELD, J. (Clinical Journal, Vol. XXV, No. 16, p. 253, Feb. 1, 1905). In discussing deaths from anesthesia in childhood it is easy to confound those which are due to the anesthetics with those caused by surgical shock, hence cases should be excluded where the condition is serious before the operation is undertaken. Deaths of healthy children who are undergoing anesthesia for comparatively slight operations are by no means uncommon. It is probable that the annual mortality reports which show a considerable number of deaths from anesthesia do not represent the sum total of fatalities from this cause. Anesthesia in infants presents especial difficulties, as in these young subjects it is difficult to estimate the patient's condition. A healthy child may die during anesthesia before true anesthesia is established and before any operation has been begun. It may take place in the course of an operation, and the latter not be responsible by shock or hemorrhage for the fatality. Death may take place at various intervals after the withdrawal of the anesthetic. The explanation of the first group of cases is by no means simple, but is especially likely where chloroform is used, and it is probably caused by vagus inhibition. Another explanation is that it is due to temporary respiratory interruption due to spasm. This causes dilatation of the right side of the heart, and imperfect elimination of the chloroform, which continues to act upon the heart muscle. Whatever the mechanism, these deaths occur with terrible suddenness. They do not occur except where chloroform is used. By some it has been supposed to be due to the irritating effects of the vapor, but these syncopal deaths do not occur with ether, chloride of ethyl, or other anesthetics. Fright and terror may bring about a fatal syncope before operation. In admitting this, the question may be asked why syncopal deaths never occur when other anesthetics are used.

The second group of cases are those in which death occurs during complete anesthesia. When the operation is proceeding it might perhaps be referred to the operation, but if no important structures or large nerves are involved, and if there has been little hemorrhage, the operation itself cannot be looked upon as the cause. As a rule such deaths are not sudden, but occur by gradual failure of respiration or of the pulse which may not be appreciated, their sudden cessation alone attracting attention, which gives rise to the belief that the death was sudden. These cases should never occur, and do not with those who are constantly handling anesthetics in children. The skilled anesthetist should always be able to detect the dangerous symptoms. Where ether is used, it is only possible to produce death when there is a combination of some asphyxial influence. This may not be readily seen by the untrained. Where death occurs after the anesthetic has been withdrawn for five or ten minutes, the fatality is due to the continued action of the drug, which though inhaled some minutes before has not yet been carried from the lungs in sufficient quantity to exert its deleterious effects upon the heart or medulla. At this period food may be drawn into an insensitive larynx and may cause asphyxia. The opinion is too widely held and acted upon that in the very young chloroform is the only suitable anesthetic.

Conditions Which May Be Mistaken for Meningitis.—Baumann, E. P. (British Journal of Children's Diseases, Vol. II, No. 2, p. 49, Feb., 1905), says that as a rule menigitis occuring by itself is readily diagnosticated, but the difficulty is to distinguish other affections which closely resemble it. Occasionally tubercular meningitis may be mistaken for typhoid, or the complications of general miliary tuberculosis may be overlooked. With these few exceptions the diagnosis of meningitis rarely offers much difficulty.

It is otherwise with cases in which meningitis is simulated. In these cases an accurate differential diagnosis is sometimes impossible. This is due to the fact that many illnesses produce such profound disturbance of the nervous function in children. It is probable that in a large number of these cases the cerebral symptoms are caused by some toxic irritant produced in the course of the disease. The history in these cases is often misleading, such as the statement of the parent that the child has had some accident. The recent death of a member of the family of consumption is an important item, particularly if the child is soon after taken ill with meningeal symptoms. The state of the bowels is not significant, as typhoid fever in children as well as tubercular meningitis is often accompanied by constipation. Delirium marks the onset of many pyrexial conditions in children. Somnolence is of no greater importance, and headache is also not reliable, though a headache which accompanies somnolence is a suspicious symptom. Kernig's sign is of little diagnostic import. It is present in a large number of cases of true meningitis, but it may occur in a number of widely different morbid conditions. It may be absent in cases of true meningitis. In many cases it is present only at certain periods of the disease. Tache cérébrale is of still less value, for it is present in a large percentage of children suffering from trivial pyrexial and other disorders. Head retraction is of importance only when it is very pronounced, as is often the case in posterior basic meningitis. In most febrile diseases the pulse follows the temperature, and slowness of the pulse with a high temperature strongly suggests a cerebral lesion, although it does not serve to differentiate meningitis from other cerebral affections. The urine and eye-grounds should always be examined. Sometimes basic meningitis is found without changes in the disk, and distention of the veins and blurring of the disks may occur in other diseases besides tubercular and suppurative meningitis. Choroidal tubercles are sometimes seen, and are confirmative of tuberculous meningitis. Squint and nystagmus are confirmatory signs, but they occur in other conditions, and it is often difficult to be sure that a strabismus was not present before the beginning of the illness. The abdomen should be carefully examined for evidences of enteric fever or tuberculous lesions. The ears should be inspected in every case, and will frequently be found at fault. The Widal test is valuable in confirming or excluding typhoid fever. It should be repeated more than once.

Lumbar puncture is so easily carried out that it should be undertaken as a matter of routine. The cerebrospinal fluid is normally clear and translucent. Definite cloudiness or opacity signifies an inflammatory process and generally indicates suppurative meningitis. In posterior basic meningitis the fluid may be cloudy, but it contains few or no cells. In tuberculous meningitis the fluid is usually clear. It may be clear in suppurative meningitis if the passages from the cerebral ventricles to the subarachnoid space are occluded. Film preparations should be made from the fluid, and after straining examined for organisms. The cells should be counted and differentiated. Normally the fluid contains few or no cells. In tuberculous meningitis there is usually an excess of mononuclear cells. In suppurative meningitis the polymorphonuclear cells preponderate. In posterior basic meningitis there is usually slight excess of polymorphonuclear over the mononuclear cells. The fluid may also be submitted to bacteriological examination, which sometimes shows the tubercle bacillus, but more frequently the fluid is sterile. In other forms of meningitis the causative organism can frequently be cultivated. An examination of the blood for leucocytosis should be made. A count of over 25,000 strongly suggests a suppurative process, especially if the majority of the cells are polymorphonuclear.

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ORIGINAL ARTICLES

MANIFESTATIONS OF RHEUMATISM IN INFANCY AND EARLY CHILDHOOD.

By Arthur Tenney Holbrook, of Milwaukee, Wis.

The term "rheumatism," as employed to-day, is comparable to the term "diphtheria," as used before the discovery of the Klebs-Loeffler bacillus. In the absence of an exact definition, based on accepted etiological factors, we find medical journals and societies the arenas of much dispute over various manifestations of disease that are said by some to be "rheumatic," "rheumatoid," or "rheumatism" of certain tissues or organs, and said by others to be anything from "idiopathic peritonitis" to "growing pains." Such confusion of terms will exist until the cause of rheumatism may be incorporated into its definition, and then these indefinite terms will die the hard, slow death that has been accorded the kindred expressions of "diphtheritic sore throat" and "diphtheroid."

This lack of distinct understanding of what rheumatism really is; the frequnecy with which rheumatism in children is overlooked, because of peculiar symptomatology; the great importance of an accurate diagnosis when rheumatism is present in the young—are the factors that have stimulated this study and presentation of the subject.

There is practically an agreement on this statement: Rheumatism is caused by an accumulation in the blood of some poisonous matter which irritates especially the fibrous and serous tissues. The nature of the poison and its origin are the mooted points.

Such theories as Mitchell's spinal cord lesion, or Constatt's vasomotor disturbances, nowadays receive no support. Theories of the climatic, miasmatic, and weather origin; of the results of "unbalanced metabolism," of "hereditary weakness"—all perhaps have their grains of truth, but separately or collectively they can stand on no ground but that of contributing factors.

There is a poison—what is it? The uric acid excess seemed for a time to offer an explanation, but repeated investigations and experiments, prominently those of Garrod and Bartels, refute the idea. Probably the most popular theory has been that there is an excess of lactic acid in the blood, a theory which was long saved from refutaton because there is no reliable quantitative test for lactic acid in the blood. Richardson in his experiments injected lactic acid into the peritoneal cavities of cats and dogs, and, although no joint affections resulted, he produced endocarditis. His results, published many years ago, satisfied many of the supporters of the lactic acid idea until the germ theorists produced endocarditis by their injections, and also the important addition of joint affections.

In 1899 Wasserman succeeded in isolating a streptococcus which produced in rabbits multiple arthritis, endocarditis and death; and then reproduced the same coccus in the blood of the infected rabbit. Malkoff and Westphal later succeeded in repeating the experiment, and Menzer reports a similar streptococcus found in cultures from the tonsils of one hundred rheumatic patients which, when injected, caused joint affections in guinea pigs.

Singer, after a series of most elaborate bacteriologic experiments with the blood, perspiration, urine, and joint secretion, concluded that acute rheumatism is due to a process of infection resulting from the circulation in the blood of different kinds of pathogenic bacteria, with subsequent formation of peripheral metastases.

Heimann, who has carefully followed the bacteriologic experimentation, believes the cause is an attenuated variety of pyogenic bacteria, entering the system usually through the tonsils, digestive and respiratory tracts. The germs and toxins develop, then find their way to the serous cavities, and by predilection the joints, and set up an inflammatory process. The absence of purulency in the joint effusions he explains on the ground of attenuated virulency of the infecting microbes. Complicating endocarditis is caused, he believes, by the direct affection of the endocardium by these germs and toxins, rheumatic chorea being similarly produced by affection of the cortical cells of the cerebrum.

Additional support is given the germ theory by certain clinic and pathologic findings. The symptomatology of an acute rheumatic fever is certainly analogous to that of other infectious diseases. The blood findings correspond to those of pneumonia, diphtheria, erysipelas, and other acute infectious diseases, showing a diminished hemoglobin, between 65 to 75 per cent., of normal; a marked diminution of red corpuscles; and a leucocytosis of 16,000 to 19,000 per cubic millimeter. Pathologically, the findings of hemorrhages in different organs, such as heart, liver, kidneys, suggest infection.

Of the predisposing causes, heredity is the most potent, especially in children. Holt's figures show hereditary influences in two-thirds of his cases; and Cheadle's carefully compiled statistics show nearly as large a percentage. Exposure to cold is almost invariably given in case histories as an immediate cause. On the whole, therefore, it seems justifiable to place rheumatism in the category of infectious diseases, considering its symptoms to be the result of microbic activity (probably of a streptococcus) and toxin development and absorption; the disease development being influenced by certain conditions of heredity, climate, etc.

Pathologically, the synovial membranes of the joints during an attack are highly injected, and there is an effusion of fluid containing blood cells and sometimes leucocytes. Minute hemorrhages into the membranes or other tissues of the heart, liver, kidneys, etc., are not uncommon. The cartilages of the joints are swollen, but it is extremely rare for them to ulcerate or suppurate, and bacteriologically the fluid is practically sterile. Tendinous, fibrous nodules may be formed, as will be noted later.

With this understanding of the etiology and pathology, we take up the manifestations of rheumatism in the young, omitting muscular rheumatism, scarlatinal rheumatism, and the so-called rheumatoid affections.

Acute articular rheumatism is rare under three or even five years of age, and is extremely rare in infants under one year of age. But nineteen authentic cases under one year were collected and reported by the American Pediatric Society up to 1899, and but few authentic cases have been added since. Seibert collected thirteen cases under one year; Henoch, Senator, Koplik, all reported cases. Guthrie had one case, in a child eleven years old; and Jaccound had two cases shortly after birth, in each case the mother suffering from acute rheumatism at the time of delivery. In the Charing Cross Hospital records for eight years there were four hundred and fifty-two cases of rheumatism, which included but one young infant. Errors of diagnosis, and the fact that few rheumatic children are sent to hospitals, prevent exact statistics; but the case records of our most reliable pediatricians show the rarity of the disease in these early years of life.

The type of rheumatic fever in children is so different from that in adults that Carmichel has said: "Those unaccustomed to children would hardly recognize an acute attack of rheumatism by taking the adult type as a guide." In fact, rheumatism in the young is overlooked with surprising frequency, and is confused with grippe, scurvy, neuritis, syphilis, tuberculosis, bruises, sprains, and very often with so-called "growing pains." It is, however, more often overlooked than confused with other affections.

These facts must forcibly impress upon us the importance of knowing thoroughly the manifestations of this disease in children, when we realize that the vast majority of heart lesions are of rheumatic origin, and that an unrecognized rheumatism, time and time again, has unnecessarily crippled a heart.

In a well-marked attack the temperature is rarely over 101.5 degrees. The swelling of the joints, as a rule, is very moderate, the pain also is slight, and oftentimes there is nothing more than a stiffening of joints, with very slight pain on motion. Usually but few joints are affected and frequently but one. In the order of frequency of affection, probably ankles stand first, then knees, small joints of the feet, wrists, elbows, hips. The skin is moist; but the excessive perspiration of the adult type is absent. The urine is highly colored, dense, and shows an excess of lithates.

Da Costa, in commenting on the seeming mildness of these symptoms, says that all too often the physician postpones his diagnosis until the dreaded complication of the damaged heart tells the story. And indeed so frequent is this complication as to give it almost the position of a symptom. Endocarditis and pericarditis are far more frequent complications of rheumatism in children than in adults. McPhedran has calculated that in cases between one and ten years of age, 83 per cent. suffer heart lesions; and between ten and twenty years, 69 per cent.; the percentage decreasing proportionately with increasing age. The seriousness of heart lesions bears no constant relation to the severity of articular trouble. In fact, arthritic symptoms may be so slight as to be entirely overlooked, and the heart lesion one of gravity. Endocarditis is more frequent than pericarditis, while myocarditis, though occasionally reported, is rare. The heart affection usually appears following an attack, but may appear during active symptoms, sometimes appearing as an irregular, intermittent type, breaking out afresh as new joints are affected.

Endocarditis is usually ushered in by restlessness, hurried respiration, dry cough, uneasiness or even pain in the cardiac region, a rise in temperature, and the development of a murmur, which is usually of mitral origin, and heard near the apex during systole, being followed usually by an accentuated second sound or a reduplication of the second sound at the apex. Occasionally, instead of the mitral an aortic murmur is present; and very rarely a diastolic aortic, or a diastolic or presystolic mitral. The heart's impulse is increased in force. Alteration in the size of the heart is practically impossible of detection. The pulse is tense and beats are of unequal force and length. Ulcerative endocarditis or cerebral embolus may be sequelae of this condition. Besides the marked signs of endocarditis given, we often encounter a dullness of the first sound without distinct murmur, giving what Da Costa has called by the convenient term of a "murmurish" character.

Pericarditis presents the symptoms of endocarditis with greater local distress and pain and higher temperature. It is diagnosed by the classic signs of friction rub, followed by increased area of dullness from effusion, displacement of the apex upward, muffling of apex sound. Plastic pericarditis may follow.

Another complication, or accompaniment of rheumatism which is so constant as to make it useful diagnostically, is tonsillitis, which may precede, accompany or follow the joint manifestations. Tonsillitis often ushers in an attack of endocarditis resulting from rheumatism, and is often associated with marked irritability and emotional disturbances. Pleurisy also frequently develops during or following an acute rheumatism in children. Torticollis may be present for a day or two during an attack, but does not persist. Chorea, which we have learned to consider as the result of rheumatic intoxication, oftentimes is the first manifestation of an acute attack of rheumatism in children, and may develop at any time during or after the attack. After a severe articular attack, or after repeated attacks, there not uncommonly develop in children subcutaneous, fibrous nodules, which are almost never seen in adults. They are oval, semi-translucent bodies, like sago grains, varying in size from a pin's head to a hazelnut, and are found mainly about the joints, but also may be found about tendons. They are often painless, but may be slightly tender to pressure. They usually are absorbed, and disappear within a few weeks, but may persist for months, and almost always are associated with endo- or pericarditis. An accompanying erythema is frequently seen in children; and in severe cases a purpuric condition is occasionally seen, with numerous subcutaneous hemorrhages. Anemia is a constant result of rheumatism in the young, and is particularly marked where the heart has been affected.

In making a diagnosis of rheumatism in infants and children, we must consider the following points: (1) Heredity. At least two-thirds of the cases show this influence. (2) History of previous attacks. In children attacks are usually repeated. Careful questioning should be made about previous joint swellings; tenderness and stiffness; "growing pains;" tonsillitis; torticollis; heart symptoms, erythema. (3) The clinic picture we have described. (4) The exclusion of the following: Multiple neuritis, tuberculosis, syphilitic bone disease—each of which may be readily distinguished by careful attention to family and clinic history, and to anatomic location of the affection.

"Growing pains," so-called, are an important consideration, as is shown by Brockbank, who collected five cases of well-marked rheumatism with the dreaded heart sequelae, which had been diagnosed as "growing pains." If there be such an affection as "growing pains," it must be located in the epiphyseal lines, and certainly cannot be confused with the clinic symptoms of a rheumatic attack, if careful examination is made.

Finally we must consider scurvy, which presents the most difficult differentiation, and that in very young children. Holt says: "In an infant, when symptoms are confined to legs and are not accompanied by fever, they are almost certain to be due to scurvy, even though the gums are normal, and the ecchymoses have not yet appeared." When the gingivitis, swellings and ulcerations about the teeth, and discoloration of the mucous membranes appear, the diagnosis of scurvy is unquestioned, especially when coupled with this is a history of bad feeding and of continued use of proprietary foods. A final proof of the correctness of diagnosis is in an immediate improvement under anti-scorbutic diet, with no other treatment.

It is well in considering a diagnosis of acute rheumatism in the young to establish the following points, which A. B. Marfan insists are determining: (1) Mobility of joint; (2) proneness to migrate from joint to joint; (3) absence of all tendency to suppuration; (4) Frequency of inflammation in heart and various serous surfaces; (5) favorable action of salicylates.

Acute rheumatism *per se* is seldom, if ever, dangerous to life in children. In the great majority of cases the articular symptoms would disappear without special treatment. The danger lies in the cardiac complications. Since one attack of rheumatism is almost certain to be followed by another, and since where the heart is once affected the lesions usually increase with each recurrence, rheumatism in children, once firmly established, is a grave affection. A succession of subacute attacks without marked joint lesions is the most dangerous form for the heart.

The duration of the rheumatic attacks reported in young infants averages from eight, fourteen to twenty-one days. Where the heart is affected, acute symptoms, chiefly cardiac, persist for five or six weeks. A murmur developed during an acute attack, indicative of mere roughening, may entirely disappear in the course of a few months, provided no fresh attacks of rheumatism intervene. Dilatation of the heart often follows any of the rheumatic heart lesions. Chorea is rarely a serious complication. Persistent anemia, following rheumatism, especially where the heart has been involved, is very stubborn and oftentimes serious. Although cases are reported of permanent crippling, in children the joint affections almost invariably clear up with no permanent thickening or ankylosis.

The primary purpose of this paper does not comprehend the treatment of rheumatism in children; but inasmuch as the manifestations are greatly modified and importantly influenced by well-directed treatment, it is proper to add this consideration.

During an attack the greatest care must be used to keep the little patient absolutely at rest, and to prevent chilling. The child should be kept very quiet in bed, in flannel nightdress, and between blankets. The effect of diet on rheumatism must necessarily be imperfectly understood until the etiology of the affection is completely determined. It is established, however, that rheumatic children do best upon a diet from which the starches and sugars are excluded. Milk is the ideal food; later in the attack broths and fish may be added. Water drinking should be encouraged.

The first question under drugs naturally concerns the effect of the salicylates. On the point of their usefulness there is practically an agreement among pediatricians; as to their physiologic effect, there is wide variance of opinion. They are to be preferred to salol, salipyrin and the many substitutes and combinations flooding the drug market, because of reliability of preparation and certainty of results from fixed, well-established dosage. The salicylate of sodium is perhaps the most widely used and reliable, and may be given safely, in divided doses, up to thirty or forty grains (2 to 2.5 grams), in twenty-four hours, to a child of five years; and up to twice that amount to a child of ten. It may be given conveniently in syrup. After three or four days the dose is gradually diminished. If the child does not respond to the use of salicylates after three days, they should be discontinued. If heart complications are developed, they should also be stopped.

Their chief use is to relieve the pain, and, all things considered, it seems wisest to reserve them for that use alone. Heimann suggests the use of salicylate of sodium as a prophylactic, in doses of three to five grains (.2 to .3½ grams), three times daily, for one week of each month, and for the period of one year, following an attack, much as quinine is used in malarial subjects. This course has, however, been generally criticised as based on false therapeutics, the generally accepted theory being that the salicylates have no specific anti-rheumatic effect, but that they simply relieve pain; and, inasmuch as they are somewhat depressing to the heart, and may split up into carbolic acid in the system and irritate the kidneys, the continued use of the salicylates is dangerous. The rational course is to use the salicylates for the relief of pain; and when they are contra-indicated, and when they have served their purpose, to substitute for them alkalis with plenty of water, such as sodium bicarbonate, fifteen to twenty grains (1 to 1.5 grams) in simple syrup every three or four hours, or divided doses of potassium acetate up to two drams (8 grams) daily.

Quinine is the safest drug to add for temperature reduction, and may be given up to six grains (.4 gram) daily in a child of five. If necessary, opium, bromides and chloral may be given for rest. Goodhart recommends potassium bromide, five grains (.35 grams), and chloral, one or two grains (.07 or .15 grams) for a child of five or over.

The joint symptoms in children, as a rule, do not call for local applications. If called for, relief may be gained by wrapping the joints in cotton wool, outside of which oiled silk, protective or dental rubber may be bound. Flannel bandages saturated with a solution of potassium nitrate are also useful. For persisting swelling of joints the following ointment is recommended: Ten to twenty grains (.65 to 1.30 grams) of iodine, and one-half ounce (16 grams) of belladonna ointment, in one ounce (32 grams) of lanolin. The much advertised pastes and muds, with their startling variety of names of anti-something, have failed utterly even to approach their claims in a fair number of trials made in institution work.

The use of anti-streptococcic serum in rheumatism, based on the streptococcic theory of infection, has been made by Menzer, Chipman, and others, and although the procedure is interesting, it must as yet be regarded in a purely experimental stage.

As to prophylaxis: Clothing, climate and diet are influential, as is well understood. Jacobi recommends the removal of large tonsils and adenoids, and the careful cleansing and douching of lesser nose and throat affections, in the belief that much infection gains entrance through these avenues. Walsh urges the cleansing of the digestive tract to prevent absorption; and Charcot believes that rheumatic infection not only enters at these points, but also through wounds, contusions, bruises, fractures, etc. For the anemia following rheumatism, in addition to iron preparations, cold douching of the spine and cool baths are highly recommended, but must be used with caution and consideration of heart conditions. Where heart trouble is suspected or established, hot emolient poultices or sinapism should be applied to the precordia. Some pediatricians prefer the ice-bag, but, as a rule, children stand extreme heat better than extreme cold.

The usefulness of drugs and measures for the relief of the distressing symptoms of rheumatism is unquestioned; but the most important part of the treatment in children is that which is directed toward maintaining the activity of the various organs of the body, *with the greatest possible economy of the heart's action.*

Fisher says it is very easy to mistake physical weakness for laziness in children, and where this error is made in a child whose heart has been embarrassed by rheumatic affection, a grave injury always results. The only safe rule is this: In any case of illness in a child, where rheumatism has not been positively excluded from the diagnosis, the child should be kept absolutely at rest in bed; carefully protected against any chance of being chilled; given a diet restricted in sugar and starches; encouraged to drink freely of water to which an alkali may be added if thought best; and the heart carefully watched.

No harm could ever result from such simple precautions, while, from the wide adoption of such measures, many hearts would be spared serious affection, and the places of many invalids would be taken by strong men and women.

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THE SEQUELAE OF SCARLET FEVER.*

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According to the census of 1880, there were 10,142 annual deaths in the United States from scarlet fever. For the year ending May 31, 1890, scarlet fever had 5,969 victims in this country.

The total number of deaths reported as due to scarlet fever in the United States during the census year ending May 31, 1900, was 6,333, giving a proportion of 6.6 deaths from this disease in 1,000 deaths from all known causes, and a death rate of 11.6 per 100,000 of population. In 1890 the death rate was 13.6. In England and Wales the death rate from this disease during the year 1899 was 11.7.

The following table from the United States census of 1900 shows in the aggregate and for the cities and rural districts the death rates from scarlet fever in the census year per 100,000 in comparison with 1890:

	Aggregate.		
Registration states.	Total.	Cities.	Rural.
Connecticut—1900	6.7	6.6	6.9
1890	10.9	11.3	10.6
District of Columbia—1900	9.0	9.0	——
1890	7.8	7.8	——
Maine[1]—1900	7.8	5.9	8.2
Massachusetts—1900	13.7	14.9	10.
1890	8.7	9.3	6.7
Michigan[1]—1900	9.1	7.6	9.7
New Hampshire—1900	7.0	6.9	7.1
1890	5.3	8.1	4.1
New Jersey — 1900	12.3	15.9	7.6
1890	14.3	19.1	8.2
New York — 1900	11.2	13.9	5.4
1890	15.9	20.1	9.2
Rhode Island—1900	8.2	8.5	7.6
1890	10.1	9.0	11.7
Vermont—1900	4.1	8.6	3.4
1890	6.3	3.5	6.6

[1] Non-registration in 1890.

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*Opening paper of a discussion on the sequelæ of scarlet fever, read before the Practitioners' Club, Newark, N. J., Oct. 3, 1904.

For the year ending June 1, 1900, the mortality from scarlet fever in five large cities was as follows:

Boston	172.
Newark, N. J.	59.
New York City	331.
Brooklyn	192.
Washington	25.

The reports of the New Jersey State Board of Health show that for the nine years ending 1902 there were 1,926 deaths from scarlet fever in this State, and during the past ten years, 419 lives have been lost in our own city of Newark from this disease. It is evident, therefore, that one of the formidable sequels of scarlet fever is death.

Nephritis stands prominently among the dreaded and common sequelae and must always give rise to the greatest alarm. The acute exudative forms of nephritis belong to the second or third week of the disease. Most of these cases last about four weeks and terminate in recovery. There occurs, however, in the third week an acute diffuse nephritis. This form of nephritis is apt to persist and to go on up to the patient's death.

Other sequelae are: Chorea, otitis media, noma, necrosis of the nasal cartilages (*Reference Hand Book Med. Sci.,* Vol. VII, p. 57), glandular involvement, orbital cellulitis (*American Medicine,* Vol V, p. 232), necrosis of bone (*American Medicine,* Vol. VI, p. 959), relapse with six days between the attack (H. Frazer, PEDIATRICS, January, 1903, p. 56). In some 12,000 cases of scarlet fever, a true relapse or second attack appeared in 7 per cent. In one instance a young woman had three different attacks of scarlet fever within a period of three months. In the last of these she died (Ford Caiger in *Allbutt's System,* Vol. III, p. 176).

Cellulitis is a serious sequel. A case of true imbecility was presented to the pediatric section of the New York Academy of Medicine, March 13, 1902, by Dr. Henry Illoway in a boy four years old. Deafness (*American Medicine,* Vol. III, p. 446). Deaf-mutism (Von Jürgensen). Progressive involvement of the limbs, with paralysis and wasting, has been reported (*Ref. Hand Bood, Med. Sci.,* Vol. VII, p. 56). Tuberculous invasion of a joint (*Anders' Practice Medicine,* p. 242).

The vitality of Welch's preventive substances seems in some way to be lowered by the disease so that for a long time septic processes are easily taken on. Endocarditis does not seem to be common. It is, however, insidious in its inception and may be easily overlooked. Meningitis is a serious complication, but rare. Von Jürgensen has called attention to chronic epileptic conditions following scarlet fever (*Nothnagel's Encyclopedia,* p. 593). It is also possible that a latent tuberculosis may be lighted up by the disease.

For the management and prevention of the sequelae of scarlet fever we have several means at our command. To reduce the mortality of the disease we have: (1) Prophylaxsis; (2) The use of so-called specifics.

The disease is best prevented by an honestly enforced quarantine, often of seven or eight weeks' duration until all desquamation has ceased, and by the use of a body ointment consisting of one dram of boric acid to the ounce of cocoanut oil, applied night and morning throughout the period of quarantine and followed by a full warm bath every fifth or sixth day. The specific treatment of the disease consists in the use of the so-called scarlet fever serum and the internal use of bisulphite of soda.

The Moser Serum.—It is claimed by Dr. J. Moser that in many cases of scarlet fever a streptococcic infection can be made out. In 99 fatal cases he cultivated streptococci from the blood in the heart in 63 cases. The use of ordinary anti-streptococcic serum, however, has not proved of any use in treating the disease. Moser points out that this may be due to the fact that there are different varieties of streptococci. The organism isolated from scarlatina differs from other varieties found in other diseases in being almost innocuous for rabbits and in possessing different agglutinating power. Moser therefore prepared a special scarlet fever serum, which has given fairly satisfactory results. As there is no proof yet that the organism is the same in all cases, he produced a polyvalent serum by injecting horses with increasing doses of a mixture of living cultures obtained from different cases of scarlet fever. In 17 cases, classed as mild or moderately severe, there was no mortality. In 62 cases, classed as severe and apparently hopeless, there were 16 deaths. The earlier the injection the more favorable the result. Anders reports that it has given good results in 400 cases. The dose is 180 c.c. (PEDIATRICS, January, 1903, p. 56).

Bisulphite of Soda.—For a number of years it has been the routine of many physicians of this city to give bisulphite of soda in this disease. The use of this drug in scarlet fever was originally suggested by Dr. Edgar Holden, of this city, some twenty years ago. Dr. Holden has never seen a complication in any case where it has been used, and this has been the experience of other phyisicans whom I have consulted. It is given in 3 to 10-drop doses, according to age, of a saturated aqueous solution, repeated every two hours throughout the day.

Nephritis.—The most serious and most frequent sequel of scarlet fever is nephritis. This develops in about one-half of all the cases (*Ref. Hand Book,* Vol. VII, p. 54). Widowitz (Arch., PEDIATRICS, April, 1904, p. 284) has never had a case of nephritis among his 102 scarlet fever patients since he introduced the plan of giving urotropin as a preventive. He gives from 1½ to 7½ grs. three times a day, according to age, during the first three days of the disease, and again at the beginning of the third week for another three days.

Deafness.—Most cases of deafness acquired in early life are the result of scarlet fever. Of 85 cases of middle ear trouble following this disorder, 18 had lost the sense of hearing in one or both ears, and three were deaf mutes.

This suggests a naso-pharangeal toilet in children old enough to be handled easily, and the best seems to be a spray of menthol in benzoinol, gr. IV—dr. i, followed by a spray of benzoate of soda in distilled water, gr. V—dr. i. If the drum and middle ear are extensively involved, giving ear-ache, we should have recourse to a mild Politzer inflation.

A protracted convalescence is frequently seen. Malnutrition, septic infections and retarded development are common, and some of the patients are left for a long time feeble and anemic and mentally feeble.

THE ANTITOXIN TREATMENT OF DIPHTHERIA, WITH A PLEA FOR RATIONAL DOSAGE IN TREATMENT AND IN IMMUNIZING.[1]

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In a discussion of the value of antitoxin as a curative agent it is necessary to have a clear knowledge of the prevalence of diphtheria and of its mortality for a period of years preceding and following the introduction of serum treatment. In order to demonstrate to you the death rate of diphtheria and the attack rate, we shall rely largely upon reported cases and reported death rates, and the ratio between reported deaths and estimated population in large cities in this country. I do this for several reasons: in large cities statistics are compiled more carefully and more reliably than in smaller municipalities; it is much easier to make a collection of a large number of cases yearly and compare them with other years, or to compare groups of years with groups of years under different conditions; in large municipalities, particularly in medical centers, serum treatment has been universally adopted, and has been used with greater uniformity by the medical profession. For this study I have chosen the statistics from New York City, Brooklyn, Philadelphia, and Chicago, and a table from the twelfth census, and for the further study of the value of antitoxin I have taken the same statistics from these centers before and after antitoxin had come into general use, and to them I have added hospital statistics from Boston, London and Philadelphia hospitals, taking diphtheria classified by location of the disease, under operative procedure, by age periods, by year periods, and by comparing groups of year periods with certain other groups of year periods. Certain of these statistics would seem to court criticism; others are so graphic in the lesson they teach us that none, I am sure, will question their truthfulness. The death rate in hospitals, I feel, is entirely reliable. The death rate when computed in percentage by comparing with attack rate in city statistics is perhaps not quite so reliable, because not all cases have been reported in time gone by, and perhaps a few escape the official report of the health bureau even to this day.

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[1] Therapeutic Gazette, April, 1906.

Let us turn to the statistics of New York City, studying them for a period of years, from 1888 to 1902, the latter year being the latest statistics I have been able to obtain.

OLD CITY (MANHATTAN AND THE BRONX).

Diphtheria Croup and Membranous Croup.

Year	Cases	Deaths	Death-rate per 100,000	Case fatality	
1887	5,923	3,056	207.0	54.94	Total cases ....50,753 Total deaths ....19,186 Case fatality (7 yrs.) .37.8% Average No cases.... 6,344 Average No. deaths... 2,398
1888	6,491	2,553	167.7	39.3	
1889	6,489	2,291	146.2	35.3	
1890	4,604	1,783	110.6	38.7	
1891	5,364	1,970	118.7	36.7	
1892	5,184	2,105	123.3	40.6	
1893	7,057	2,558	145.5	36.2	
1894	9,641	2,870	158.6	29.7	
1895	10,505	1,976	105.2	18.8	Total cases ....75,123 Total deaths ....10,982 Case fatality ....14.61% Average No. cases.... 9,390 Average No. deaths .. 1,372 Total number of lives saved 8,204
1896	11,399	1,763	91.2	15.4	
1897	10,896	1,590	81.0	14.6	
1898	7,593	923	46.7	12.2	
1899	8,210	1,085	53.9	13.2	
1900	8,364	1,276	62.1	15.3	
1901	7,726	1,227	58.5	15.9	
1902	10,430	1,142	53.4	10.9	

It will be seen in studying this table that the average yearly death rate, from 1887 to 1894 inclusive, was 2,398; the average attack rate reported to the Health Commissioner was 6,344; the percentage of death by attack rate was 37.8.

In Brooklyn the following table shows clearly the mortality-statistics in diphtheria during the same period:

BROOKLYN.

Diphtheria Croup and Membranous Croup.

Year	Cases	Deaths	Death-rate per 100,000	Case fatality	
1888	2,297	1,385	164.2	55.9	Total cases ....16,443 Total deaths .... 8,990 Case fatality ....54.67% Average attack-rate .. 2,349 Average death-rate ... 1,284
1889	2,789	1,467	180.9	52.4	
1890	2,185	1,283	152.6	58.7	
1891	1,850	1,180	135.8	63.8	
1892	1,829	1,137	126.6	62.2	
1893	1,672	978	105.3	58.5	
1894	3,812	1,660	173.0	43.5	

1895	4,687	1,454	146.6	31.0
1896	5,231	1,310	127.8	25.0
1897	4,147	998	94.1	24.1
1898	3,221	745	68.9	23.1
1899	2,894	744	65.7	25.7
1900	3,856	863	73.7	22.4
1901	3,942	732	60.5	18.6
1902	4,236	762	61.0	18.0

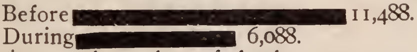
Total No. cases 32,214
Total No. deaths 7,608
Case fatality 23.61%
Average No. cases ... 4,028
Average No. deaths .. 951
Total number of lives saved 2,664

Here the average attack-rate from 1888 to 1894 was 2,349; the average death rate was 1,284; the percentage mortality, compared with attack rate, was 54.67 per cent.

"In Chicago the treatment by the Department of Health was begun in October, 1895, and the two periods therefore include 1888 to 1895 as 'before," and 1896 to 1903 as 'during.'

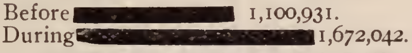
"Following is a simple graphic showing of the two periods:

TOTAL DIPHTHERIA DEATHS BEFORE AND DURING ANTITOXIN TREATMENT

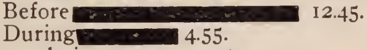


Reduction in actual number of deaths, 5,400—or 47 per cent.

AVERAGE ANNUAL POPULATION.



DEATHS PER 10,000 OF POPULATION.



Increase of population, 52 per cent.
Decrease of diphtheria deaths, 63.4 per cent.

"Chicago statistics show from 1888 to 1895, inclusive, 11,488 cases, and a yearly average death rate of 1,436, whereas from 1895 to 1903 a total of 6,088 deaths, or a yearly death rate of 781. Taking the total number of deaths for each eight-year period in Chicago, we find a saving of 5,400 lives, or an actual reduction in number of deaths of 47 per cent., and when we in turn make an allowance for the increased population, the reduction of lives is actually 52 per cent."

In Philadelphia, where we were a little slow to take up the use of antitoxin, and where we know that antitoxin was first used only in the more severe types of cases, we cannot be said to have used this agent with any degree of uniformity before the beginning of 1879. For this reason I have not taken the years 1895-96, believing them to be too little influenced by antitoxin to count as antitoxin years, and yet influenced too much to place with a group of years in preantitoxin days. The following table shows a total of 19,826 cases reported to the Board of Health during the period from 1888 to 1894 inclusive, with a total number of deaths of 8,825:

Year.	Cases reported to the Board of Health.	Death from diphtheria croup.	Per cent. mortality.	Estimated population.	Death-rate per 100,000.
1887	Not recorded	858	.....	993,801	36
1888	1,170	323	53.24	1,016,753	31
1889	1,455	727	50.00	1,040,245	39
1890	1,820	943	51.81	1,046,964	90
1891	3,251	1,362	41.89	1,069,264	127
1892	5,051	1,757	34.78	1,092,168	160
1893	3,471	1,159	33.39	1,115,562	103
1894	3,608	1,396	38.68	1,139,457	122
1895	3,853	1,349	35.00	1,163,864	116
1896	3,595	1,155	32,13	1,168,793	91
1897	5,779	1,474	25.50	1,214,256	121
1898	4.676	1,154	21.67	1,240,266	93
1899	4,391	994	22.63	1,266,832	78
1900	5,088	1,042	20.47	1,293,697	80
1901	3,578	643	17.97	1,321,408	48
1902	2,444	515	25.06	1,349,712	38
1903	3,043	608	19.98	1,378,624	44
1904	3,456	542	15.68	1,408,154	38

Summary, 8 years, 1887 to 1894, inclusive:

Total cases, 7 years	19,826
Total deaths, 8 years	8,825
Average yearly population	1,064,277
Average yearly deaths	1,103
Case fatality, 7 years	40.18%
Deaths per 100,000	103

(Cases for 1887 not recorded.)

Summary, 1897 to 1904, inclusive:

Total cases	32,455
Total deaths	6,972
Average yearly population	1,309,118
Average number of deaths	871
Case fatality	21.48%
Death-rate per 100,000	54

The average yearly population during this period was 1,064,277; the average mortality per 100,000 was 103, the average yearly death rate was 1,103; the total mortality computed from reported cases was 40.18 per cent; whereas during a period from 1897 to 1904, inclusive, the average yearly population was 1,309,118; the average number of deaths, 871; the total number of reported cases, 32,455; total number of deaths, 6,972; the mortality percentage, 21.48; the death rate per 100,000 was 54. It will be seen then, by comparing the latter group of eight years with the earlier group of eight years, that we have a total saving of 1,853 lives, or a total reduction in the number of deaths of 21.97 per cent. The increase in population during the same period has been 23 per cent., and should we allow for this increase in population, the decrease in death would be 35.92 per cent.

In New York City, during the eight years from 1895 to 1902 inclusive, a total of 10,982 deaths are reported, with an average of 1,372 each year. The total number of lives saved during this eight-year period is 8,204; the annual reduction in deaths without allowance for increase in population is 42.75 per cent.

In the city of Brooklyn, where antitoxin was not taken up quite so early or so earnestly, we have during the eight years ending in 1902 a total of 7,608 deaths, or an annual death rate of 951, as compared with 1,284 during the seven years preceding the introduction of serum. During the same interval 32,214 cases were reported to the Board of Health, with a death rate of 23.61 per cent., as compared to the preceding seven years with a mortality of 54.67 per cent.

To summarize from this date, we find that in Chicago, where hospital accommodation is small, and where they very early aided serum therapy by appointment of antitoxin administrators and Board of Health intubators, the statistics show a great amount of saving of life. In Chicago, as an earlier table has shown, 5,400 lives have been saved; in Brooklyn, 2,664; in New York, 8,204; and in Philadelphia, 1,853. This makes a grand total of 18,121 lives saved in four American cities.

The following table from the twelfth census shows the number of deaths per 100,000 population in the largest cities in the United States:

Average annual rate	..	1890	1891	1892	1893	1894	1895	1896	1897	1898	189.	1900
Average for cities in New England	77	94	56	88	90	121	98	99	73	31	42	66
Boston, Mass.	97	103	62	103	114	179	130	112	87	35	55	96
Fall River, Mass.	44	69	30	74	35	49	70	72	30	18	21	25
New Haven, Conn.	67	122	66	93	115	71	32	99	85	33	22	17
Providence, R. I.	52	95	47	52	51	35	68	95	56	25	26	39
Worcester, Mass.	54	40	49	76	52	74	68	65	54	32	37	46
Average for cities in Middle States	101	114	124	129	129	139	106	100	95	63	62	66
Jersey City, N. J.	123	209	177	153	126	152	102	159	119	79	51	58
New York, N. Y.	102	118	126	131	154	108	112	97	85	48	55	62
Newark, N. J.	99	173	105	113	138	84	121	151	79	51	53	58
Paterson, N. J.	126	87	200	171	112	171	99	134	184	69	84	96
Philadelphia, Pa.	107	90	127	161	104	123	116	97	113	93	79	81
Rochester, N. Y.	64	75	89	157	104	73	42	52	46	28	33	29
Scranton, Pa.	70	182	71	53	13	21	54	72	72	54	98	87
Syracuse, N. Y.	51	57	35	82	125	70	22	41	58	44	21	46
Average for cities in Lake States	79	119	118	123	104	93	98	76	49	38	51	46
Buffalo, N. Y.	53	43	63	65	62	74	81	79	62	26	24	19
Chicago, Ill.	86	115	118	129	117	107	119	77	52	44	56	50
Cleveland, Ohio	68	104	109	120	92	60	62	73	38	41	32	48
Milwaukee, Wis.	91	196	189	183	93	101	74	79	41	23	40	44
Toledo, Ohio	83	263	128	79	110	37	42	55	22	30	128	79
Average for cities in Southern States	54	66	80	69	52	57	46	41	52	47	43	44
Baltimore, Md.	68	73	89	95	46	50	66	59	85	63	56	71
Memphis, Tenn.	17	50	49	17	10	19	25	5	7	5	10	5
New Orleans. La.	31	56	44	46	50	61	28	20	17	5	7	13
Washington, D. C.	42	68	107	60	77	78	26	41	44	76	70	41
Average for cities in West and Central United States	61	95	87	78	69	61	87	58	36	32	33	47
Cincinnati, Ohio	67	165	107	105	68	74	51	55	45	23	29	26
Indianapolis, Ind.	69	..	157	156	110	59	100	39	23	28	40	33
Kansas City, Mo.	39	26	45	22	35	45	64	61	33	30	29	42
Minneapolis, Minn.	45	114	63	41	28	30	62	56	15	15	23	56
Omaha, Neb.	57	129	115	86	49	53	34	41	35	15	19	20
St. Louis, Mo.	68	54	74	60	76	76	136	72	45	47	43	75
St. Paul, Minn.	56	90	74	108	64	42	73	48	30	42	26	35
San Francisco, Cal.	51	61	151	104	73	24	15	14	33	46	32	23

The question will at once be raised: Has antitoxin done all this saving of lives, or has any part been accomplished by better quarantine methods? To this argument I would reply that quarantine had been enforced before the days of antitoxin. Laboratory methods, too, had been used in studying this disease, and yet, as some of the earlier quoted statistics will show, there was no material reduction in the number of deaths per hundred thousand of population. Then, as I have shown in the cases of Chicago and Philadelphia, we should have been entitled to a much larger number of deaths from diphtheria had we considered the increase in population during the antitoxin era. In Chicago, for instance, as already stated, the actual reduction in the number of deaths is 47 per cent.; allowing for the increase in population it would be 52 per cent. In Philadelphia the actual reduction in deaths is 23 per cent; allowing for the increase in population it would be 35.92 per cent. In New York and Brooklyn I have not worked out this percentage, because I have not had the estimated population in year periods, but by making an approximate comparison it will be seen that the reduction there would be about midway between Philadelphia and that of Chicago.

The preceding table from the twelfth census shows that this reduction was not local, but that in many parts of the United States a marked reduction took place after anti-toxin was introduced. In five of New England's largest cities the average number of deaths per 100,000 population has been 77 for a period from 1890 to 1900 inclusive. Since 1896 the rate has been persistently below the average. In the eight largest cities in the Middle States the average has been 101 per 100,000; since 1897 it has remained below 66 per 100,000. In five large cities from the Lake States the average has been 79; since 1896, 51 or below. The average for four southern cities has been 54 per 100,000; since 1895 the average has been less than 50. For the seven large middle western cities and San Francisco, the average, 61 per 100,000, since 1897 has remained below 47 per 100,000.

In every instance in individual cities or in groups of cities the drop has been too sudden to attribute to any factor other than to antitoxin as a curative and immunizing agent.

I am perfectly willing to admit that some reduction in death rate has been accomplished by better quarantine methods. I am willing even to grant that quarantine methods may have saved the difference between the actual reduction in number and that which would have occurred had the older method of treatment and quarantine been continued. I doubt whether the most enthusiastic health officer would claim much more. In hospitals, however, we are dealing with another problem. Here we know what we can do. Here we are dealing with similar conditions before antitoxin days and during the antitoxin era.

Let us for a moment study the statistics of the Metropolitan Asylums Board Hospitals in London. If the combined statistics of all hospitals in London under the supervision of the Metropolitan Asylums Board be summed up in tabular form, they express most graphically what antitoxin has done in that great city in a period from 1888, the time of the earliest admission of diphtheria patients to the M. A. B. Hospital, to 193 inclusive.

Year.	Admissions, diphtheria.	Deaths diphtheria.	Mortality per cent. of patients treated in hospital.		
1888 ...	99	46	59.35		
1889 ...	722	275	40.74		
1890 ...	942	316	33.55	Total admissions	11,598
1891 ...	1,312	397	30.63	Total deaths	3,517
1892 ...	2,009	583	29.35	Mortality	30.32%
1893 ...	2,848	865	30.42		
1894 ...	3,666	1,035	29.29		
1895 ...	3,635	820	22.85		
1896 ...	4,508	948	21.20		
1897 ...	5,673	987	17.69		
1898 ...	6,566	991	15.37	Total admissions	56,145
1899 ...	8,676	1,182	13.95	Total deaths	8,008
1900 ...	7,873	988	12.27	Mortality	14.26%
1901 ...	7,622	849	11.15		
1902 ...	6,520	739	11.04		
1903 ...	5,072	504	9.69		
Total ..	67,743	11,525			

During this time 67,743 cases passed through these hospitals with a total number of 11,525 deaths. In 1888 the death rate was 59.35 per cent.; in 1903, 9.69 per cent. Grouping these years by periods preceding the introduction of antitoxin, and following it, we find in the interval, 1888 to 1894 inclusive, a total of 11,598 cases with 3,517 deaths, a mortality percentage of 30.32. Taking the period from 1895 to 1903 inclusive, 56,145 cases were treated in these hospitals with a total of 8,008 deaths, a mortality percentage of 14.26—just a little less than half the mortality in the prenantitoxin era. Taking the average death rates in these hospitals in quinquennial periods we have the following:

AVERAGE DEATH-RATES FOR DIPHTHERIA IN METROPOLITAN ASYLUMS BOARDS HOSPITALS IN QUINQUENNIAL PERIODS.

1887-91.	1892-6.	1897-1901.	1902-3.
33.6	25.5	13.7	10.4

M. A. B. REPORT, 1903.

All forms of diphtheria, 1890 to 1894, and this table includes all cases treated with antitoxin, 1895 to 1903.

	Year.	Cases.	Deaths.	Mortality per cent.
Before use of antitoxin	1890-3	7,111	2,161	30.29
Antitoxin in occasional use..	1894	3,042	902	29.65
Antitoxin used in every case	1895	2,182	615	28.1
	1896	2,764	717	25.9
	1897	4,381	896	20.4
	1898	3,186	906	17.5
	1899	7,038	1,082	15.38
	1900	7,271	936	12.88
	1901	6,499	817	12.57
	1902	6,015	714	11.8
	1903	4,839	493	10.18

Coming home and taking the statistics of the Boston City Hospital and of the South Department, we have the following table, which expresses well what antitoxin has done there. These figures and the accompanying graphic chart I am permitted to publish through courtesy of Dr. John McCollum:

Number of cases of diphtheria treated at the Boston City Hospital proper and at the South Department from 1888 to 1903, inclusive; number of cases of intubation for the same time; 1888 to 1894 no antitoxin; 1895 to 1903 antitoxin:

Year.	Number of cases of diphtheria.	Died.	Per cent. of mortality.	Per cent. of recovered.	Number of intubations.	Died.	Per cent. of mortality.	Per cent. of recovered.
1888	382	176	46.07	53.92	100	78	78.00	22.00
1889	529	239	45.17	54.82	128	104	81.25	18.75
1890	415	151	36.38	63.61	93	79	84.94	15.05
1891	237	105	44.30	55.69	50	42	84.00	16.00
1892.......	387	185	47.80	52.19	65	56	86.15	13.84
1893	419	203	48.44	51.55	109	90	82.56	17.45
1894	698	266	38.10	61.89	89	74	83.14	16.85
Total ...	3,067	1,325	43.20	56.79	634	523	82.49	17.50

1895	1,455	207	14.22	85.77	118	64	54.23	45.76
1896	1,889	276	14.61	85.38	224	145	64.73	35.26
1897	1,387	181	13.04	86.95	146	67	45.88	54.11
1898	817	97	11.87	88.12	71	42	59.15	40.84
1899	1,621	162	9.99	90.00	192	63	32.81	67.18
1900	2,547	293	11.50	88.49	259	87	33.59	66.40
1901	1,576	185	11.73	88.26	184	58	31.52	68.47
1902	1,008	111	10.20	89.79	145	49	33.79	66.20
1903	1,179	138	11.70	88.29	139	37	26.61	73.38
Total ..	13,479	1,650	12.24	87.75	1,478	612	41.40	58.59

Here we find a total in the preantitoxin days of 3,067 cases, 1,325 deaths, a death rate of 43.2 per cent in all forms of diphtheria; and laryngeal cases requiring intubation, a total of 639 cases, 523 deaths, a mortality of 82.49 per cent. Compare this with the period after antitoxin was introduced in Boston. In the antitoxin era we find the total of 4,779 cases, 1,650 deaths, a death rate of 12,24 per cent., and during the same interval with 1,478 intubated cases, 612 deaths, a mortality rate of 41.4 per cent. It will be seen by these tables that in all forms of diphtheria a reduction in mortality has been made from 43.2 to 12.24 per cent. and in laryngeal diphtheria requiring intubation the mortality was cut in half.

In our own city, and in our own hospital, we are not able to quote such remarkable results. I believe there are very good reasons why we have not accomplished here what has been done in other places. In the first place our Municipal Hospital has, unfortunately, borne the name of "pest-house" ever since diphtheria was first admitted for treatment. During a part of the antitoxin era we were so unfortunate as to be compelled to treat on the same grounds many hundreds of cases of smallpox. I am sure my distinguished predecessor, Dr. Welch, will bear me out in the statement that many mothers will not permit their children to come to the hospital because of its proximity to, or, as they feel, its actual contact with, the smallpox hospital. Largely because of this unfortunate situation in Philadelphia, we have a much higher percentage of severe cases than other similar institutions, and our mortality statistics are made up from bad cases rather than a mixture of all types of this disease. It is for this reason, I believe, that we get our cases late in the disease. Many mothers, and I fear in some instances physicians too, have a certain fear about sending a child to the Municipal Hospital, unless they are positively convinced that the case is one of severe diphtheria, and that it must have hospital care. Then, too, there is another reason: Philadelphia physicians assumed an attitude of extreme conservatism toward antitoxin. It was taken up late and in no very enthusiastic way, and practitioners tended to delay giving it until they saw the case would be a serious one.

The following table from our own hospital statistics shows that even with Philadelphia's conservatism and its unfortunate situation, as far as its hospital is concerned, a considerable reduction in death rate has been accomplished:

Year.	Diphtheria patients treated.	Died.	Per cent. deaths.	
1892	183	48	28.22	Measles and mixed cases included.
1893	217	62	28.57	
1894	465	154	33.12	
Total ...	865	264	30.52	
1895	706	190	29.61	
1896	869	193	22.02	
Total ...	1,575	283	24.32	
1897	1,295	300	23.16	
1898	1,229	297	24.16	
1899	1,273	275	20.02	
1900	1,299	264	20.31	Measles excluded.
1901	889	174	19.57	Measles and mixed cases included.
1902	601	137	22.79	
1903	581	97	17.73	Measles, mixed cases and moribund cases dying in 24 hours excluded.
1904	712	77	10.81	
Total ...	7,779	1,621	20.31	

These reductions in city death rates and in hospital practice are but a small part of the reduction which can be accomplished if the family practitioner will but take up the use of antitoxin in sufficient dose to cure, without waiting for a culture return to confirm him in his suspicions.

The above quoted statistics require no explanation other than to say no material change has occurred in treating diphtheria since the introduction of antitoxin. The tendency is more toward withholding drug treatment and toward giving larger doses of antitoxin when indicated. It tends toward early diagnosis and early administration of serum.

I am sure there are those who believe the general adoption of intubation for laryngeal stenosis has, in this country been largely responsible for the decrease of mortality. To combat this argument I submit the following table from the M. A. B. Hospitals where tracheotomy is still practiced:

M. A. B. HOSPITAL'S REPORT FOR 1903.

All forms of laryngeal cases—Cases treated with antitoxin.

	Year.	Cases.	Deaths.	Mortality per cent.
Antitoxin in occasional use	1894	466	289	62.0
Antitoxin years	1895	461	195	42.2
Cases receiving antitoxin	1896	488	141	28.8
	1897	473	142	30.0
	1898	624	199	31.9
	1899	669	190	28.4
	1900	777	182	28.2
	1901	753	159	21.1
	1902	618	125	20.2
	1903	551	99	17.96

Tracheotomy Cases.

Cases treated before antitoxin days and treated with antitoxin.

	Year.	Cases.	Deaths.	Mortality per cent.
Before use of antitoxin	1890-3	364	241	62.2
Antitoxin in occasional use	1894	261	184	70.49
Cases receiving antitoxin	1895	225	113	50.2
	1896	197	8	40.6
	1897	258	103	39.9
	1898	305	113	37.0
	1899	377	147	39.1
	1900	377	127	33.65
	1901	367	111	30.2
	1902	257	82	31.9
	1903	176	56	31.82

Compare these statistics with a preceding table and chart from the Boston City South Department, and you will see antitoxin has done in London tracheotomy cases just what it has done in America for intubation cases; or compare them with our own hospital statistics:

Year.	Total number of cases.	Total number of deaths.	Percentage mortality.	
1894	100	75	75.00	Antitoxin in occasional use.
1895	122	67	45.91	
1896	156	94	60.25	
Total	378	236	62.43	
1897	182	127	69.78	Antitoxin in general use.
1898	149	104	69.99	
1899	165	97	58.78	
1900	202	111	54.95	
1901	139	66	47.47	
1902	110	54	49.09	
1903	108	52	48.14	
1904	125	50	40.00	
Total	1,180	661	56.01	

They would tend to prove that intubation has not done in this country all that some claim for it.

To be continued.

LATE RICKETS*

By R. W. Marsden, M.D., M.R.C.P., Hon. Physician,
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Rickets, as is well known, is especially a disease of infancy. The great majority of the cases occur between the ages of 6 months and 2 years. A few cases have been described in which enlargements of the ends of the bones, with bending of the shafts of the long bones of the extremities, have been first noticed in older children, and to such the name of late rickets has been given. Cases of this description are sufficiently rare to warrant a detailed account being given each occurrence. Their nature is still disputed, though the consensus of opinion seems to favor the view that it is essentially an identical process with rickets in infancy. It may be, then, that a careful study of these cases, from their rarity itself, will help to advance our knowledge of the etiology of the commoner affection. Apart from that consideration, however, the case I am about to report offers still further interest, in that the manifestations of the disease occurred at a later date than in any previous case of which I have been able to obtain a record.

Case.—The patient is a girl, aged eighteen and three-quarters years. She is the third member of a large family of eleven children. Her parents, aged 54 years (father) and 43 years (mother), are living, of apparently normal development, and both strong and healthy. She has three brothers and three sisters living. None of them have suffered from symptoms of rickets, and none of them have had thickenings of the ends of the bones, nor bending of the limbs. Three male children died in infancy—one from "concussion of the brain" after a fall, one from bronchitis, and one from "consumption of the bowels." A female child also died when aged 4 years, the cause being stated to be "paralysis of one side of the body."

The mother has never had any miscarriages, and the children have all been apparently healthy at birth, not showing any evidences of a syphilitic infection. The mother says that at the birth of the child under consideration there was an unusual quantity of "water" (liquor amnii), and the infant, though plump and well formed, was very small. Since birth she has always been small and under-developed. During her infancy she had no enlargements of the bones at the wrists, knees, or ankles, and there was no bending of the bones of the extremities. She had, however, a large abdomen, and the skin had a yellowish tint. In addition, she suffered from attacks of diarrhea and vomiting, and her stools were very offensive, "quite different from the other children." At two years of age she suffered from measles, at four years from scarlet fever, and since she was about seven years of age she has had attacks of headache and sickness, which have recurred almost every two or three months. She has never menstruated. She was brought up exclusively on the breast until she was four months old. She was then put on cow's milk and water, equal parts, sometimes having a biscuit crumbled into it. When between five and six months old she was allowed a crust of bread to suck. At nine months she got a little beef-tea, or gravy and bread, and in addition some potato. Till twelve months old she was kept on the bottle, but after that "ordinary food" was given. Of the other children, three were on the breast till two years of age, and the rest till nine months old, and all these children developed steadily in a normal manner, being free from any symptoms of gastro-enteritis or rickets.

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*Edinburg Medical Journal, April, 1905.

The first tooth was cut when she was eight or nine months old. She did not have much trouble when cutting her teeth, but she was three years old before all had appeared. She was able to sit up at six months, to crawl on her hands and knees at fifteen months, and she was two years old before she was able to walk. When five years old her mother thought she seemed very much smaller than other children of the same age. She had always been small, but her mother noticed it more at that age. There was no bending of the limbs, and no enlargements at the ends of the long bones. She went to school when she was between four and five years old. Her habits were not different from those of other children, except in respect to food. She played, and took part in all outdoor games. At fourteen years of age she left school, and at fifteen years she went to work. She worked from 6 a.m .to 5 p.m., and though the work was not heavy, she was kept indoors almost the whole of that time. There were many other girls about her own age at the same work, and they were apparently quite healthy. She continued at work for three years. She has apparently from an early age been peculiar in respect to her predilections and objections to various kinds of food. She would eat meat of any kind, including ham or pork, on every opportunity, and as much as her parents would give her. She would also take bread, but she steadfastly refused to take any vegetables, and was not partial to milk. Further than this, she might be described as having a craving for ordinary table-salt, eating it alone, openly and clandestinely. In these respects she differed absolutely from the other children in the family.

She had been vaccinated in infancy, and this operation was repeated when she was seventeen and three-quarters years old. Three weeks later she complained of general weakness and loss of appetite. When eighteen and one-quarter years old, after taking a long walk she was very much exhausted, and from that time she has never seemed able to walk without great fatigue. Her legs were then, however, quite straight, and there was no swelling of the wrists, knees, or ankles. The weakness in muscular power seemed to increase, and, in addition, her appetite was very poor. Two months later she began to complain of pains in the legs, and walking or standing became difficult and caused pain. Soon afterwards also she suffered from pain in the arms and back.

When eighteen and one-half years of age it was first noticed that the ankles and knees were swollen, whilst the left leg began to bend inwards at the knee. Subsequently the right leg began to bend outwards, and swelling occurred at the wrists. These swellings have been gradually getting more marked since, and she has steadily become weaker, so that she is now totally unable to walk.

Present Condition.—The patient is a small sallow girl of eighteen and three-quarters years. Her weight is 63 lbs. 10 oz., and her height 50⅛ in. She is very intelligent, but her general development corresponds rather to that of a girl of ten or eleven years. The breasts, however, are well developed, and are alone in conformity with her age. There is no hair in the axillæ, and very little over the pubes, The face has a yellow, rather sallow, appearance, and the exposed parts of the sclerotics are pigmented a yellowish-brown color. The parts of the sclerotics covered by the eyelids are not pigmented. There is also a brownish pigmentation of the skin at the root of the neck, over both folds of the axillæ, over the front and sides of the abdomen and the lower part of the chest. The linea alba below the umbilicus is well marked.

The skin is soft, smooth, free from scars, and, beyond the pigmentation mentioned, seems quite healthy. The face is well-formed and intelligent looking. The nose is not retroussé, nor flattened across the bridge. The head is dolicho-cephalic, having a circumference of 19⅞ in., and free from parietal or other bosses. The forehead is rather narrow than broad, but its general configuration and position is good. The teeth are extremely irregular in position, being considerably over-crowded, especially in the region of the upper canines, and there is extensive caries. The tip only of the left upper lateral incisor shows through the gum. The gums do not show any swelling, but in several places adjoining the teeth they tend to bleed with slight mechanical irritation. The thyroid is slightly enlarged, being distinctly visible, smooth, and elastic. There is no evidence of enlargement of the thymus. No signs of any abnormal condition, on physical examination, could be detected in the lungs, liver, or spleen. Over the heart a faint systolic murmur was audible at the pulmonary area, and also in the vessels of the neck; otherwise no abnormality was noted.

Bones.—There is marked enlargement of the lower epiphyses of the ulna and radius in both arms; also of the lower epiphyses of both femurs, and the upper and lower epiphyses of the tibia and fibula in both legs. In addition, all these bones were distinctly shorter than the normal. The variations can be seen in detail from the following measurements:—

Circumference of left radio-ulnar enlargement	5¾	inches
" above " "	4⅞	"
" of right " "	5⅞	"
" above " "	5	"
Length from styloid process of ulna to external condyle of humerus	7	"
And from external condyle to acromion process	10	"

Circumference of left knee over the patella	10⅝	“
“ “ just above patella	9¼	“
“ round heads of tibia and fibula	9½	“
“ over the malleoli	7⅜	“
“ just above the malleoli	6⅜	“
Length of thigh from the anterior superior spine of the ilium to the upper point of the internal condyle of the femur	13	“
And from the internal condyle to the tip of the internal malleolus	13	“

Taken directly, the length from the anterior spine to the tip of the malleolus is 25 inches, the loss of 1 inch being due to the marked genu valgum.

On the right side the measurements show corresponding changes, thus:—

Circumference at the knee over the patella	10½	inches
“ “ just above the patella	9⅜	“
“ round heads of tibia and fibula	9⅜	“
“ over the malleoli	7½	“
“ just above the malleoli	6½	“
Length from the anterior superior spine to the internal condyle of the femur	12	“
And from the internal condyle to the internal malleolus	12	‘

As already stated, the left leg is in the position marked genu valgum, whilst the right shows slight genu varum.

Handling of the limbs showed that there was much tenderness, which was most marked over the head of the fibula. Tapping over the enlarged ends of the bones, over the shafts of both tibiæ, over the forehead and parietal regions, and all along the spine, caused distinct pain, but there was no softness felt either in the bones or the enlarged epiphyses. The clavicles were of normal contour, and not definitely enlarged at their inner ends. The sternum showed no change. All the ribs were distinctly enlarged at the point of junction of the bony and cartilaginous portions, and these enlargements were visible below the skin both above and below the breasts. The ribs seemed broad, but were pliable, and wanting in resistance. The bone itself seemed fairly firm. On the left side, in the axilla, they seemed to be tender.

The circumference of the chest at the level of the xiphisternum was 27½ in., and above the breasts 27 in. There was no evidence of any marked deformity in the shape of the thorax. It is, however, a noteworthy fact that the act of inspiration only increased the circumference by ¼ in. It may be that this was due to the marked muscular weakness.

The spine showed a general kyphotic curve when the patient was in the sitting posture, apparently also due to the weakness of the erector spinæ. There was no scoliosis, and no enlargement of the spinous processes, which were not unduly prominent. The angles of the scapulæ remained flat against the sides of the chest.

The measurements of the spine were as follows:—From the occiput to the seventh cervical process, 4 in.; from the seventh cervical process to the level of the iliac crests, 12¼ in., and to the tip of the coccyx, 19 in.

There was no supraclavicular swellings, no flat foot, and no clubbing of the fingers or toes. The muscles of both arms and legs were very soft and flabby, and, as already stated, there was marked muscular weakness. The grasp of both hands was very feeble, and flexion or extension at any joint and in any limb could without difficulty be resisted or prevented by the opposition of one finger.

Examination of the fresh blood showed no difference in the size or shape of the red corpuscles, which arranged themselves into characteristic rouleaux. The hemoglobin gave 65 per cent. of the normal. The number of erythrocytes was 3,450,000 per c.mm., and of leucocytes 4,000 per c.mm.

The urine was very faintly acid, its specific gravity was 1,020, and there was no albumin, no albumoses, and no sugar. On standing it remained quite clear, save for a slight deposit of mucus. Urea was present to the extent of 9 grains per ounce, the average daily amount of urine being about 30 ounces.

The excretion of chlorides for twenty-four hours was 10 grms., and of phosphates 1.9 grms. The inorganic sulphates also were abundant. There were no organic sulphates.

It is evident that the diagnosis of the above case presents little difficulty, the characteristic enlargements of the ends of the long bones, the stunted growth, the defective dentition, and the marked muscular weakness, with skeletal deformity, forming a picture so identical with rickets in infancy as to make its classification unmistakable.

In both the sexual and asexual forms of ateleiosis, or infantilism, there is an absence of the rachitic enlargements [1A]; and, further, in this disease, as well as in cretinism and achondroplasia, the facial and bodily appearances are quite different. When first seen, the great tenderness over certain bones, the marked general weakness, the distinctly sallow or brownish pigmentation of the skin, coupled with the skeletal deformity, caused one to think of osteomalacia, possibly complicated by Addison's disease. Osteomalacia, however, consists in a progressive softening of the bones, leading to deformity, and is almost confined to adults, whilst the history, sex, age, absence of gastro-intestinal symptoms, and want of localization of the pigmentation to such areas as the mouth, axillæ, etc., negative the view of the possible superaddition of Addison's disease.

It is evident, then, that the case must be considered to be of a rachitic nature, and the clear history of an absence of deformity until the advanced age of eighteen and one-half years stamps it as an example of so-called late rickets.

As already stated, rickets is essentially a disease of infancy and early childhood; thus Baginsky[1], in his work, founded on 624 cases, of which 345 were males and 279 females, only met with three cases above the age of four years, namely, one of five years, one of six years, and one of thirteen years, all occurring amongst females. Holt[2] in his most recent publication says: "Rare instances have been reported of bony deformities, in all respects like those of rickets, developing in children from 6 to 12 years old. A number of such cases have been observed in England. I have not seen this disease, nor has a case been seen during the past twenty years at the Hospital for Ruptured and Crippled, New York, where more deformities come under observation than anywhere else in this country." Though usually evidences of late rickets are seen in lanky overgrown boys and girls, still the occurrence of such cases cannot be doubted, for, as stated by a recent writer[3] on the subject, in rare instances in later childhood "the deformities of the bones much more resemble the type of rickets seen during the second year."

The question then arises, are these cases of a genuine rachitic nature? and the reply must be dependent on the opinion as to what combination of symptoms and signs constitutes the distinguishing characteristic of rickets.

Clutton[4] apparently makes the enlargement of the epiphysial ends of the long bones as the crucial test. There can be no doubt of the importance of this sign, and it is distinctly fortunate that it is most commonly and most persistently met with in situations which are readily accessible to our senses, e.g., the ribs and the long bones of the limbs. Leaving aside for the moment the consideration of the ultimate etiological factor, we know that the degree of deformity at the ends of the bones is largely dependent on the activity of the process of growth. By this means only can we apparently explain the relatively slight changes which are to be found at the posterior ends of the ribs, whilst the anterior ends of the same bones show the most marked enlargement. In the same manner, we are able to explain the manifest and constant differences which are found at opposite ends of the long bones of the limbs. It is thus evident that the bony deformity will vary with the age of the patient. Relative and absolute growth is most marked during the early period of life; and Trousseau[5] accounts for the relative immunity from rachitis of the middle period of childhood by the fact that "from the beginning of the fourth year growth proceeds more slowly up to the age of puberty, when it takes a fresh start."

It is, further, quite possible that the amount of alteration at the growing ends of the bones is dependent on the degree of intensity, and on the nature of the causal factor or factors, as well as on the condition of the supply of nutrition. It is therefore only to be expected that the clinical manifestations of bony deformity should offer great variety in different cases, a condition which agrees with everyday experience. There can be no doubt that an exact connection or relationship between the degree of epiphysial enlargement, or a constant relative size of the ends of the bones in different individuals, on the one hand, and a definite degree or severity of the constitutional alteration from the rachitic process, as evidenced by the general ill-health, the anemia, muscular weakness, and digestive or respiratory disturbances, on the other, is far from an observable fact.

In my own case it was the enlargement of bones at the wrists, ankles, and knees which caused me, in the first instance, to make the diagnosis of late rickets. Though I had never seen a previous case, the similarity, or rather the identity, of appearance was so unmistakable that any other diagnosis than that of rickets was manifestly impossible. Without, then, for one moment detracting from the importance of this sign, I am still of opinion that theoretical considerations, as well as the practical observations of other writers, which I shall mention later, do not warrant us in accepting Clulton's verdict, that it constitutes a crucial test. It seems to me that, in the state of our present knowledge, any alteration in the growth of bone, in the nature either of a deficient or an abnormal formation, and either affecting all the visible or palpable long bones, or only affecting the bones of certain regions, might, coupled with manifestations of general ill-health, conceivably be of a rachitic nature. In connection with this point, it is possible that the use of the Röntgen rays may in the future be of the greatest assistance. From the radiograms of the affected bones in my own case, excluding deformities, it is evident that two marked abnormalities are present. In the first place the outlines of the ends of the bones are lacking in sharpness and distinctness, owing probably to the deficiency of lime salts in those situations. A still more marked alteration, however, is the excessive width of the epiphysial cartilage, which, instead of being about 1-12 of an inch across, is at least five or six times as broad. Both of these peculiarities are mentioned by Professor Roos[6] in connection with a case which he reports, and in a footnote (p. 122) he states that, so far as he knows, the X-rays have seldom been used for the diagnosis of rickets. Owing to the kindness of Dr. Ashby and Dr. Hutton, I have been able to obtain radiograms of three other cases of rickets, whose ages were respectively four and one-half, six and one-half, and thirteen years, all of which show a similar condition as regards the epiphysial cartilage.

It has been observed by Kassowitz[7] that the height of the growing epiphysial cartilage, so far as concerns its growth on the side of the diaphysis, varies with the age of the individual, but shows as age advances a steady, though increasingly slow, diminution.

Kassowitz gives the following figures for the breadth of the intervening cartilage:—

In a six-months-old fœtus	2.4 mm.
In the new-born	1.6 "
In a one-year-old child	0.6 "
In a three-year-old child	0.4 "

The above measurements were taken from the anterior ends of the ribs of apparently normal growth, whilst at the same situation in rachitic infants this investigator obtained the following measurements:—

In a 2 months' child	7.0	mm.
In a 3 months' child	8.0	"
In a 1½ years' child	7.0	"
In a 2 years' child	3.5	"
In a 2 years' child	5.0	"
In a 2½ years' child	2.2	"

A comparison of these two sets of figures shows the enormous enlargement of the growing cartilage at the end of the diaphysis in rachitic subjects, and the post-mortem evidence here given seems to me to cause great importance to be attached to the manifestations given by the X-rays in the cases I have cited.

Professor Roos was only able to find two cases in which the rays had been used for diagnostic purposes. In one of these, described by Maffei of Brussels, there is stated to have been "a delay in the epiphysial ossification." In the other, mentioned by Poland[8], there is no reference to the width of the cartilaginous zone, the evidence being limited to the statement that "the epiphysial lines of the femora and tibiæ were seen to be unaltered from their normal direction."

It is thus evident that the use of the Röntgen rays may be of the greatest assistance, not in the diagnosis of a typical case of rickets, but in the irregular and abnormal developments of growing bone, by assisting in the elucidation of their nature, and it is greatly to be hoped that ere long we shall have a complete consecutive series of observations illustrative of the normal condition at various ages. An examination of the radiograms of the three cases which I have been able to obtain, shows that the position of the external epiphysial enlargement is taken up by the broad band of cartilage which I have mentioned, and it may be that the measurement of this cartilaginous zone will constitute a much more reliable test for the diagnosis of rickets than the one advocated by Clutton. On this point it ought to be mentioned that James[9], in a youth aged twenty, found by the X-rays no evidence of incomplete epiphysial union.

A detailed study of my case, then, confirms the generally accepted view that they are of a genuine rachitic nature; and this opinion has been substantiated by Barlow and Abercrombie[10], who conducted a post-mortem investigation upon a case reported by Dawtrey Drewitt[11]. In that case the writers found that "the bones present all the features of the infantile disease."

At the present time Comby[12] is the most prominent opponent of the view of the rachitic nature of these cases. He regards them as identical with osteomalacia. Trousseau[13] even went further, and stated that in his opinion osteomalacia and rickets are one and the same disease. Kassowitz and other writers upon this subject have, however, shown the non-identity, and even marked dissimilarity, between these two diseases; and we may, on theoretical grounds, accept the genuinely rachitic nature of such cases as my own, for, as pointed out by d'Espine and Picot[14], ossification is not complete till after twenty years, and increased rate of growth takes place between fifteen and twenty years.

The question next arises, are the rachitic manifestations ever visible for the first time in later years without any previous indication of rickets in early life? If we accept Clutton's "crucial test" for rickets, then my own case and many others (Clutton's, Dawtrey Drewitt's, James', etc.) must compel an immediately affirmative answer. Theoretically, when we remember that the process of growth is continued throughout the first twenty years of life, there can be no objection to the possibility of its arising at any period during that time. A consideration, however, of the reported cases seems to indicate that the supervention of rachitic bony deformity after a prolonged period of normal growth must be a very great rarity, if not an as yet unobserved occurrence.

Taking the cases seriatim in which I have been able to find evidence upon this point, it is to be noted that in Clutton's second case, a girl of fourteen years, she had always been "very small and stunted in growth," being then only 3 ft. 10½ in. in height and 4 stones 2½ lbs. in weight. Drewitt's case is stated to have been a healthy and active boy till nine years old. There is no mention made of his height; but having weaned at 2 months, and fed on milk, with cornflour and arrowroot, we are not surprised to learn that, though there was no tenderness, no restlessness, and no deformity as an infant, and that he cut his teeth early, yet there was marked nocturnal sweating about the head, and that "he could walk well and run at two years," but apparently not before.

Jones' case was a young man, aged twenty, who beyond having three or four fits as a child, for which no cause is suggested, was apparently healthy till seventeen years of age, when he had been for two years serving as a sailor on board ship. He was 4 ft. 8 in. in height at twenty years; but the spine was hollowed, so that allowance must be made for this fact. In the absence of bendings of the long bones of the leg, it would seem that he had probably always been much below the normal height, and it is unfortunate that no further evidence is given upon the point.

In Roos' case the girl had been breast-fed for two months, is said to have digested cow's milk well, to have cut her first teeth at seven months, and to have walked at 12 months. She then had "gastro-intestinal catarrh," and became weak, and lost the use of her legs for two months. The legs were quite straight till the onset of her illness at twelve and one-half years old, but she had always been a small child, and at seventeen years of age her height was only just over 4 ft. In my own case and in Dr. Hutton's there was similar lack of development. John Thomson of Edinburgh[15] also reports the case of a child who had been apparently quite healthy till six and one-half years old, when he had an attack of severe diarrhea, after which the symptoms and signs of rickets developed for the first time. It is stated that the boy was small, but the information is insufficient to serve as a guide to the importance which must be attached to this statement.

To be continued.

SOCIETY PROCEEDINGS

NEW YORK ACADEMY OF MEDICINE

SECTION ON PEDIATRICS

DR. L. E. LA FÉTRA in the Chair

EMPYEMA.—Dr. La Fétra presented a case of empyema in which a cure seemed to have been achieved without operative intervention. The patient was a boy who had had an illness in September, 1904, said to have been typhoid pneumonia. Dr. La Fétra saw him about two months later, when he had been coughing for several weeks, especially in the morning, and was suffering from weakness, anorexia, rise of temperature in the afternoon and night sweats. Exertion occasioned pain in the abdomen. Upon examination, flatness was found, extending from the base of the right chest up to the angle of the scapula, and Skodaic resonance above and in front. Pus was taken from a puncture below the scapula to the amount of half a syringe full. But a few days later at the Roosevelt Hospital no pus could be obtained, although repeated punctures were made, and the attempt renewed at intervals afterward. The patient improved steadily, and by the last of December there was only a slight dulness perceptible, and the breathing sounds were nearly normal. No discharge from the bronchi was posible, for no mucus had been coughed up at any time.

Dr. H. Koplik said that in his own experience empyema had never been cured by aspiration alone. He had tried it thoroughly in a number of cases where immediate operation could not be done, but although punctures subsequent to the first one often failed to find pus for a time, it invariably returned later. In one case six punctures had been made, operation being delayed because of high fever, and the presence of an unresolved pneumonia. In the end an operation was done and the patient made good recovery. He thought that in Dr. La Fétra's case either the pus was so completely removed by the syringe that the patient's natural powers of resistance were able to dispose of the remainder, or else the effusion remaining had become inspissated, and simply a thickened pleura had been left. It was his own habit, in case pus was found on puncture and then could not be obtained by later attempts, to keep the patient under observation, percussing the chest at least once a week, and if any flatness was detected, to make further exploration.

Dr. Chapin inquired if in those cases a protracted temperature was observed.

Dr. Koplik answered that the temperature might keep low for several weeks and then suddenly jump two or three degrees.

Dr. Chapin mentioned the case of a child two years old who had a pneumonia which seemed resolved, as the temperature was normal for nearly a fortnight. A needle was introduced and pus found. Dr. Chapin thought that as a rule a hectic temperature was common in such cases.

Dr. J. E. Winters thought that in the case mentioned by Dr. La Fétra pus was still present somewhere, and cited two cases in his own experience. In one of these he made the diagnosis of empyema, but a needle introduced at six different points failed to find pus. Subsequently, after the patient had been under observation for a number of months, the pus was discovered to have burrowed through the right crus of the diaphragm and appeared as a superficial abscess well down in the lumbar region.

Dr. M. Nicholl Jr. thought that unresolved pneumonia should be no contraindication to an operation, as autopsies showed that in at least half of the cases, respiration was embarrased by the fluid in the pleural cavity.

Dr La Fétra repeated his statement of the improved condition of the patient, the improvement of breathing and voice sounds, the normal temperature, the gain in weight. He recalled a case seen two years previously in which under similar conditions a patient had been operated upon and only an edematous pleura found, the pus having been inspissated and absorbed. Nevertheless, it was his belief that the chances of recovery in empyema without operation were so slight as to make it the duty of the physician to operate in every case.

Standardized Gruels.—Dr. H. D. Chapin had been studying the value of cereal gruels in infant feeding, and had prepared some statistics by which advantage could be taken of the fact that they may help to economize the energy of the body in its effort to prepare food for assimilation. He had had gruels made from wheat flour, prepared barley flour, pearl barley and rolled oats, one ounce of each to a quart of water, boiling the pearl barley three hours and the others one hour. The resulting gruels were analyzed: the pearl barley giving 1.483 per cent solids; the prepared barley flour 2.288; rolled oats 1.930; wheat flour 2.494. The proteid percentage was: barley 0.140; prepared barley flour 0.195; rolled oats 0.262 and wheat flour 0.330. By increasing the amount of cereal a proportionate increase in the composition of the gruel was obtained. One level tablespoonful of pearl barley weighed one-half ounce aviordupois, of the other cereals used one-quarter ounce. These data would furnish a table for making gruels as accurate as those used in modifying cow's milk. Plain gruels could not be made much higher than two ounces to the quart, but the dextrinized gruels could run as high as eight ounces. Dr. Chapin showed a table giving the approximate percentages of proteids and carbohydrates in gruels of varying strength, the fat and mineral matter being merely a negligible quantity. He had found the high proteid gruels valuable in checking persistent vomiting and in many other conditions. Contrary to the popular belief the vegetable proteids are good tissue builders and not hard to digest. In well-cooked gruels the cellulose of the cereals was broken up and the proteids exposed to the action of the digestive enzymes.

Dr. J. E. Winter did not agree with Dr. Chapin that cereals should be used in young infants, before the end of the first year. Infants fed on gruels did not bear the hot weather well, and always failed. Any baby fed on gruels up to six months of age was practically starving. The gruel, as the soiled napkins showed, passed the digestive tract undigested. Cereals should never be used before the sixth month, in summer not before the seventh or eighth, and if the child had diarrhea not under a year.

Dr. Koplik said he had had marked success with cereal gruels. He had used cereal gruels and milk for babies from birth and they had done well on it. Some had failed to gain weight until the cereal was added to their diet of milk and malt preparation. Wheat flour was one of the most important foods. He had fed twin babies until their present age of one year on wheat flour gruel and milk, and they had thrived beautifully, although unable to digest cow's milk or cow's milk and barley water. He had had a large experience in feeding cereal gruels and milk, and he wished to reaffirm that from earliest age babies would thrive on milk modified with gruels when they would not on milk modified with water.

Dr. T. S. Southworth said that Dr. Chapin had made notable contributions to the question of infant feeding, both from the point of view of scientific study of fundamental principles, and from that of the application of these principles. Every new contribution met with criticism, and it was well that it should. Dr. Chapin did not claim that he originated this method of feeding, which was due to Dr. Jacobi, nor did he recommend cereals as the exclusive food. A baby could not be nourished for a long period on cereals alone, but they were invaluable when a radical change was necessary for a time, and nothing else would take their place in summer diarrheas. No modification of cow's milk could make it the counterpart of human milk. The methods used in dextrinizing the gruels formed sugar, and young infants could not absorb sugar. Too much fermentation might be produced by the use of these gruels in some cases. Most of the knowledge of infant feeding had hitherto been of the empirical sort, and the time was now ripe for a more exact knowledge.

Dr. J. F. Bell mentioned some results of his laboratory work. Foods could be divided into three classes, alkaline, neutral and acid; and those mentioned by Dr. Chapin belonged to the acid group. Gruels developed in long boiling purin bodies that were dangerous in infant feeding.

Dr. Winters said that the fact that babies fed on milk and gruels thrived, was no evidence that the gruels had anything to do with it. They must never be used exclusively, for small infants, although in the second year they could be the chief article of diet.

Dr. R. G. Freeman thought that babies generally did better on simple modified milk, but if they failed to digest that, the addition of gruels might aid digestion. He did not feel absolutely sure of the correctness of the theory that infants could not digest starch.

Dr. Koplik said he had never heard of feeding an infant on nothing but cereal gruel except for short periods of acute illness.

Dr. Chapin briefly reviewed some of the points which he had made in what he has written on the biology of cow's milk. Cow's milk could never be made like human milk. When placed in a baby's stomach it was a foreign body and unphysiological. But the cereal gruels made it more nearly like mother's milk than anything else he knew of, because they caused finer flocculent masses. He asked the members to consider results in the light of his histories. It was not right to say that it was the milk and not the cereal which was of benefit. Very feeble babies in hospitals, the sort most difficult to feed, thrived well on cereal gruels. No one system of baby feeding should be expected to succeed in every instance.

NEW YORK ACADEMY OF MEDICINE

Orthopedic Section.

Meeting of February 17, 1905.

Dr. Homer Gibney, Chairman, in the Chair.

Pott's Disease.—Dr. Jaeger presented a case of Pott's disease of the spine as follows: Symptoms began about April 1, 1896. Mother first noticed child holding head forward, and he complained of pain in back and side of neck. Examination at that time showed a well-nourished, healthy boy, walks with head slightly forward. A prominence at about the sixth cervical—spine below seventh cervical flat and rigid. Note made on January 5, 1897. Child in good condition, wearing brace since previous May. No increase of deformity. He wore the brace off and on for two years—then discarded it. There were no symptoms until four years ago, when a boil formed on inner side of right shoulder blade. It was poulticed and broke open, and has been discharging ever since. Two years ago another abscess formed under left shoulder blade. This was opened and has remained open ever since. He has had general medicinal treatment—carbolic washes—but has worn no brace. His appetite has been good, he sleeps well, and gets about without any trouble. Lately he has complained of pain in back and shortness of breath. Now we see boy pale and weak—holds head bent forward. Examination of spine shows but slight deformity, and the tracing to-day is almost identical with the tracing taken nine years ago. There are two discharging sinuses. A review of the literature shows that disease of the laminae is very rare. The only reference to a similar case was in the *American Journal of Surgery and Gynecology* for April, 1903, where Eastman (St. Louis) describes a case in an adult.

Osteitis of the Spinous Processes and Laminae Simulating Tuberculous Disease of the Body of the Vertebra, or Pott's Disease.—Dr. Reed, house surgeon, Hospital for the Ruptured and Crippled, by invitation reported this case: Frances C., aged six years, was admitted to the Hospital for Ruptured and Crippled June 13, 1904, diagnosis of Pott's disease of the lumbar spine. She was admitted for the relief of an abscess. Nothing definite could be learned in the way of a history. She had been living near St. James, Long Island, for the last three years, and the deformity was not recognized for a month prior to her admission to the hospital. During this month it had rapidly increased, and she presented on admission uniform posterior curvature of the spine from the upper dorsal to the sacrum, but no angular deformity. There was a good deal of infiltration on either side of the spinous process with tenderness, but fluctuation was not made out. There was a little psoas contraction on the right side, but no psoas abscess was discovered.

She was put on a Bradford frame, and two months later the psoas contraction had disappeared, but there could be made out fluctuation over the spinous processes of the dorso-lumbar. In December, five months after her admission, there was a distinct tumor and fluctuation under the gluteus-maximus muscle on right side, and this infiltration on either side of the spinous processes had rather increased, but there was marked fluctuation on the left side. The spinal deformity was, if anything, less pronounced.

On the morning of the 14th of February an incision was made through the gluteus-maximus down through the sac, and about six ounces of pus, with some caseous material, was evacuated. After it was thought to be completely emptied, the opening of the sac was sutured with cat-gut and the skin also sutured. Then an incision was made a little to the right of the spinous processes of the eleventh and twelfth dorsal and thick, caseous material was squeezed out to the amount of about three or four ounces. There was very little fluid. By pressing firmly over the left side as far up as the upper dorsal this material was forced out of the lower opening. A director came in contact with the loose bone. The gloved finger was inserted and the spinous processes of the lateral masses were felt completely eroded. This large sac was thoroughly cleansed with sterile gauze and the same care taken in suturing as in the other abscess. At this time the abscess under the gluteal muscles was found to have completely refilled, and the wound was re-opened and three or four more ounces of pus were evacuated. After it was thoroughly emptied again, it was re-sutured, the child put up in a plaster of Paris jacket and spica and put to bed. Up to the present time there has been little or no reaction, the temperature is about normal and the case is doing well.

Microscopic examination of the pus evacuated showed pus and blood, but no bacteria of any kind.

After Treatment.—Dr. H. C. Frauenthal presented a case about which, he said, there was nothing unusual except for the fact that he had worn a jacket for twelve years at Bellevue. He said in his experience many patients were discharged as cured after wearing a jacket for various periods, and he wished to show this case as exhibiting the effects of after treatment. When this young man was discharged he had the characteristic color of patients whose breathing had been restricted for a considerable time. The boy had now a ruddy complexion and an increase in chest expansion of three inches, which change had resulted from physical culture begun in May last—a period of ten months.

Colles Fracture.—Dr. Ashley showed a case of colles fracture. It gave an idea of how much damage such a fracture might do, and the result. Three years ago this boy had a colles fracture. Had great pain and swelling. Hot applications were advised by the physicians and used for about a week, and the present condition is more the result of the anteroposterior splint and hot applications than of the fracture. There is a massing of all the tendons. The arm can be straightened, but there are deep scars due to hot applications applied with the brace. The muscles are all adherent to the scars. The palm was very much contracted and has been a great deal worse than it is now. The styloid process had been broken or partially dislocated, and the bone was atrophied there. Also some results of the inflammatory process were seen. Nothing had been done until six months ago, when it was straightened by force and an effort was made to liberate the tendons. At the wrist a transverse incision was made and an effort to reduce the tension upon the palm. His local doctor had treated him by massage. The flexor longus pollicis tendon is rigid. The boy has no power to flex the thumb. Dr. Ashley said he had another case exactly like that in a clinic, that came to him immediately after the injury. It was not so badly scarred as that, and by manipulating it and after giving massage a perfect functional result was obtained. The injury in this case shown to-night occurred three and one-half years ago. In response to question, Dr. Ashley said he had tried to loosen the tendons under an anesthetic and that wrist is loose now compared to what it was. The X-ray showed exactly what the position was before anything was done to it. It did not show the dropping of the wrist so well.

Orthopedic Apparatus.—Dr. Jaeger described a simple device gotten up by Schade, in Dresden, for exercising the hand after an injury or phlegmon. It consisted of a series of highly-polished wooden rods twelve inches long, graduated from two and a half inches down to the thickness of a lead pencil, with a hook at the end of each, to be fastened to a Whitely Exerciser or similar apparatus. The patient begins with the largest rod and pulls. If the grasp be not sufficiently strong, it slides out of the hands. Next time he will concentrate his mind and hold harder. By this scheme of treatment the patient can see if he does not exercise properly. He works at the large rod until he acquires a good firm grip, then takes a smaller one, so on until the smallest is reached.

Dr. Frauenthal said his idea was to develop the mind and so work on the muscles, rather than develop the muscle.

Ankylosis.—Dr. H. C. Frauenthal showed a case, in line with the paper he had read at the last meeting. He had several such cases—women between the ages of forty and fifty—but the others could not come. One of them has almost complete ankylosis in both wrists; no motion. Exostosis same as this woman's hands. This patient had had innumerable doctors and all kinds of treatment—specific—here and at various springs. He thought the trouble due to gonococci. Whether this be true or not, it had yielded to treatment he had given—galvanic current and baking. She had had little internal treatment except laxatives. The joints of hands and feet were excruciatingly painful. No cultures had been made. The trouble had existed eight or ten years—mixed infection, if anything. Dr. Frauenthal thought these joints the kind referred to by Dr. Northrup in the discussion at the last meeting, as cured by this treatment, which had greatly benefited the speaker's patients. This woman had been unable to walk a block without resting, or go upstairs. In a month, after two or three treatments a week, she was much improved.

Dr. Homer Gibney said such cases were frequently seen at the Hospital for Ruptured and Crippled, and they were thought to be rheumatoid arthritis. Perhaps they were cases of gonorrheal infection, but it did not necessarily follow that *this* case was, as Dr. Frauenthal had no means of establishing it.

EDITORIAL

EDUCATION OF ATYPICAL CHILDREN

The subject of public responsibility for the education of atypical children is attracting merited attention at present, both in America and elsewhere. Dr. James Kerr, Medical Officer to the London County Council and Ingleby Lecturer at the University of Birmingham, has taken as the subject of his lectures, "Mentally Defective Children," and in the initial lecture of the course delivered on May 4, he pointed out the difficulty of defining the limits of "mental defect," and of classifying the mentally defective, ranging as they do from the merely "slow" or "backward" child to those showing pronounced idiocy. He emphasized the fact that all study of these children must be constantly controlled by reference to the normal, adding that such study was of great utility and full of suggestion as to the treatment of the ordinary child. He spoke of the mental defects due to temporary and removable causes, such as lack of proper nourishment, rest and sleep, etc., applying the term "spurious mental defect" to distinguish them.

He advocates the providing of "intermediate schools" to which all children should be transferred upon demonstration of their incapacity to derive the proper benefit from the regular school course. In these schools cleanliness, regular drill, good attitudes and automatic obedience would be insisted upon, and easier and simpler tasks assigned. With the increased individual attention some of the children would catch up with their work and return in a few months to the regular school. Others, unable to do so, would remain under an education adapted to their capacity, while still others, showing more marked defects, would pass to special classes provided for them or even to institutional life in some asylum.

Dr. Kerr notes that any sort of public provision for the mentally defective child is comparatively recent in England, especially as regards those not classified as paupers. Imbeciles were excluded from the public schools, and being greatly neglected, had come to constitute a serious public danger. Society is awakening however, to its duties and opportunities in this direction, and a Royal Commission has been appointed to consider the care and control of the feeble-minded of all classes.

In connection with Dr. Kerr's views it is interesting to cite those of Dr. Elias G. Brown, who has charge of the work for atypical children in the New York Public Schools, and has examined more thn 2,500 children. Of these children many were returned to the grades, only about 25 per cent. proving to need simple extra coaching, less than 5 per cent. requiring disciplinary training, and less than 1 per cent. being recommended for transfer to institutions. About 27 per cent., however, were found to require special methods of training in classes for what he terms "major cases." Dr. Brown seems to have solved the important problem of classifying these children with a commendable degree of practical precision. The "major cases" are those to whom appeal must be made through the senses and by physical activity, and who, consequently, require special classes conducted on different methods from those of the regular school. Manual and physical training are also important in the cases where discipline is the prominent need, but success with these depends mainly upon the personality of the teacher, as regards sympathy, strength, and ability to set rapid pace without noise and to inspire right activities.

The "minor cases" consisting of children who were slow, or backward, or suffering from nervousness, anemia, mal-nutrition, and special physical defects, should follow the methods of the regular classes, but merely at a slower pace.

The advantage of removing these atypical children from the regular grades is three-fold, inasmuch as the class teacher is relieved from a most harassing responsibility, which it is not her duty to undertake, the normal children of the class are freed from a drag that irritates and hampers, and the atypical children themselves are placed in a position where they may find normal competition instead of hopeless superiority, and a chance to make the most of the powers which they have.

It will be noted that both the English and the American physician recognize the need for more than one type of special classes, corresponding to the grade of mental defect to be considered, and Dr. Brown's arrangement of three, the training classes for the major cases, the coaching classes for the minor cases, and the disciplinary classes for the unruly, seems to be the simplest and most economical consistent with a far-seeing policy and a realization of the ultimate saving to the community.

As has been well remarked, "the time and money spent to train these children is insurance against the extra price which their neglect would cost as measured in an increased number of inmates of almshouses and reformatories."

ABSTRACTS

Case of Acute Strychnine Poisoning in a Child: Recovery. —John R. Pooler, M.B., Ch.B. (The British Medical Journal, Apr. 8, 1905), reports the case of N. S., aged eight, who came under his care at the end of January, 1904, for post-diphtheritic paralysis affecting the legs, and, to a slight extent, the palate and pharynx. She was treated with a mixture containing a liquor strychninæ hydrochlor. m iij t.d.s. for the first fortnight, and at the end of that time the dose was increased to m v t.d.s. The child progressed favorably, and the signs of paralysis were disappearing gradually. About 5 p.m. on March 1 the author was urgently summoned to the patient's home by the message that "the little girl had taken an overdose of the medicine and had been in fits for two hours." On arriving at the house he found the child in a state of collapse—face flushed, lips cyanosed, swollen, and bleeding; tongue also swollen and bitten through; pulse frequent and weak; pupils dilated. There was then no rigidity of the limbs or trunk, and she was fully conscious.

The history of the case was that at 3 p.m. the father of the child had proceeded to administer the medicine to her, and, with almost criminal carelessness, had remarked that as the bottle was nearly empty she might as well finish the lot. Notwithstanding a protest from the mother, he emptied the contents of the bottle (a large dispensary one) into an egg-cup, and the child drank the whole amount. Five minutes later, the mother, hearing a cry in another room, went to ascertain the cause, and found the little girl in strong convulsions. Her description of them was that the back and head were arched, the teeth clenched, the arms and legs either rigid or "working," no loss of consciousness, but a complaint of great pain during the fits, during which she cried out that she was dying.

The dispensary being a considerable distance from the house, the author was not sent for till two or three medical men in the immediate vicinity had been summoned, but none of them were able to attend. No real attempt at appropriate treatment was therefore started till his arrival two hours and a quarter later. The fits had continued with great severity during the whole of that time, but were then gradually subsiding.

Treatment.—Thirty grains of zinc sulphate were immediately administered in warm water, followed by strong freshly-made tea, and as no vomiting occurred, more of the drug was given a few minutes later. The fits not being severe just then, the stomach tube was also introduced and the stomach washed out with fair success. At the end of twenty minutes to half an hour, during which time the child remained free from convulsions, except for one slight attack, free vomiting set in. At the end of forty-five minutes the child, though collapsed, appeared to be much improved. No fit, except the slight one witnessed, had now occurred for an hour; the pulse was slower and stronger, the breathing normal; there was no rigidity of the limbs, and the mental state was quiescent. The doctor therefore deemed it safe to leave the patient, but returned in an hour and found her still vomiting, somewhat weak and exhausted, but otherwise out of danger. Except for a slight rise of temperature during the next thirty-six hours (99 degrees to 100 degrees F.) recovery was speedy, and in two days she was running about as usual. The author procured the same eggcup that had been used by the father and carefully measured out with water the approximate amount which on the man's own admission he had given the child. It was three-parts of the eggcupful. This was corroborated by the mother and by the little girl herself, who is quite intelligent and old enough for an independent opinion. It came to over eight teaspoonfuls—roughly ʒ ix. The dose she was taking at that time was ♏ v, aquæ ad ʒ j t.d.s. The liq. strych. hydrochlor. of the British Pharmacopœia contains 1 gr. in 110 minims of water; the regulation dose of the liquor being 2 to 8 minims, and of the alkaloid 1-60 to 1-15 gr. The child took at least 45 minims of the liquor—that is, an amount equivalent to something between one-half and one-third gr. of the pure drug.

There are one or two points of interest about this case.

First, the practically spontaneous recovery of the patient. The author is inclined to think she would have survived without any treatment whatever. It was over two hours before she received any medical aid, and by that time the fits had to all intents and purposes subsided.

Secondly, the comparatively large dose of the poison—at least for a child—though the fact that she had been taking the drug regularly for over a month must certainly have produced some amount of immunity, and this probably saved her life.

Taylor, in his book on Poisons, says: "1-16 gr. operated as a poison on a child 2 to 3 years old, and caused death in four hours, the symptoms coming on in half an hour." He also quotes Dr. Darwin, who reported a case in which ¾ gr. killed a child aged 7½ in half an hour. Taylor considers the fatal dose for an adult is from ½ to 2 gr.

Dr. Husband, in his handbook, gives the fatal dose as "from ¼ to ½ gr., but larger doses have been taken, followed by recovery."

The Encyclopædia Medica, in its article on poisons, puts down the fatal dose as "½ gr., which caused death in twenty minutes"; a little over a grain has frequently proved fatal, but recovery has taken place after 10 or even 20 gr.

The sublime contempt in which a certain section of the lay public hold the average doctor's "bottle of medicine," whether it contains a dangerous drug or not, is also a point worthy of mention.

The Pasteurization of Milk.—Gippius, A. E. (Meditzinskoie Obozrenie, Vol. LXII, No. 19, 1904), conducted a series of experiments to determine the biological changes taking place in milk as a result of pasteurization. He found (1) that the property of milk to form specific lactoserums is not dedestroyed even by boiling; (2) that the bactericidal properties of milk are retained to a considerable extent after prolonged heating at 60 degrees to 65 degrees C., and still noticeable after a short heating to 85 degrees C.; (3) that the alexins contained in the milk behave in a similar manner; (4) that the oxidizing ferments in milk are destroyed by a temperature of 76 degrees C., but retain their potency after prolonged heating at 60 degrees to 65 degrees C.; (5) that the fat-splitting ferment in milk bears pasteurization at 60 degrees to 63 degrees C., but becomes inactive at higher temperatures; (6) that the ferment which splits up salol and which has no bearing on pasteurization of cow's milk is destroyed by pasteurization; (7) that the proteolytic ferments in milk are equally active after pasteurization and only destroyed by boiling; (8) that the diastatic ferment retains its activity after a temperature of 60 degrees to 65 degrees C., but is destroyed at 75 degrees C.

As a result of these findings the author offers the following conclusions: (1) Pasteurization of milk destroys all infectious germs. (2) With proper pasteurization, the chemical composition of milk remains almost unaltered. Even admitting that an insignificant portion of the lactalbumin becomes insoluble, it is of no practical significance, inasmuch as it is a heterologous albumin which is not absorbed directly, but is coagulated and acted upon by the digestive juices before it is assimilated. (3) The most important biological properties of raw milk are preserved by proper pasteurization. Such a milk, therefore, is almost unaltered as an infant food, and at the same time possesses the advantage of keeping well and not being a possible medium of infection. The author also outlines a plan by which his conclusions could be tested clinically. He suggests the employment of four-months-old infants, who should receive during stated periods raw milk and milk pasteurized at 85 degrees C. for two minutes, as well as at 60 degrees to 63 degrees C. for one hour.

Congenital Word-Blindness.—(1) LECHNER, C. S., Congenital Word-Blindness—Aangeboren Woord-Blindheid (Ned. Tijdschrift voor Geneeskunde, No. 5, 1903). (2) STEPHENSON, SYDNEY, Congenital Word-Blindness (Lancet, Sept. 17, 1904, and Reports of the Society for the Study of Disease in Children, Vol. IV, 1904, p. 165. (3) BRUNER, WILLIAM EVANS, Congenital Word-Blindness (Ophthalmology, January, 1905).

In Lechner's opinion, word-blindness is not so rare as the number of communications published would make one suppose; but probably it often occurs that no proper notice is taken of the child's complaint of experiencing difficulty in learning to read, and we may suppose that more cases of word-blindness would be published if more attention were paid to the existence of the defect. Lechner himself was able to make the diagnosis because shortly before the patient came under his care, his attention was drawn to the subject by the communications of Hinshelwood and of Nettleship. The present case was in a country boy of thirteen years, healthy in all other respects, except that he suffered from "ophthalmia scrofulosa," for which he sought advice. On trying to take the boy's sight, Lechner was struck by the patient not knowing his letters, although he had been at school for five years. Except for slight inflammation, the eyes were normal; vision taken with Snellen's types was 5, and the refraction emmetropic. Mentally, he appeared to be perfectly normal, and, according to his parents, he was the cleverest and most ambitious of their children. His memory was excellent, for he knew the contents of his school books by heart, but only by having heard them repeatedly read at school, for, in print or written character the simplest word was quite unintelligible to him. He could copy it correctly, but did not understand his writing. His own name was in some way an exception, for he could write it down and afterwards read it with difficulty. It was remarkable that ciphers caused him less trouble than letters, since he could correctly name ciphers, and even small numbers, when he saw then written. All the persons and objects around him he could recognize quite correctly, and he was perfectly fit for anything but reading.

Word-blindness is clinically a part of soul-blindness (Seelen-Blindheit). Whereas in the latter all objects are properly seen by the patient, yet they convey no meaning at all to him, his memory for optic impression being destroyed, in word-blindness the same is the case for words and letters only. Soul-blindness is known to follow destruction of the occipital brain and parts of the angular gyrus. In word-blindness, therefore, we may assume a congenital defect in these regions, probably in the gyrus angularis and gyrus supramarginalis. Lechner could not find an explanation for the boy's different behavior towards letters and ciphers, which was mentioned also in former publications. It is hard to say what the essential difference between the two should be. One could hardly imagine that there could actually exist two separate centers in the brain for letters and for ciphers.

It is very important that the condition should be recognized as soon as possible, to save the patient from being thought unwilling or stupid, and being treated accordingly by parents or by teachers. The ordinary school is not the place for these children, who should be carefully taught by a patient and persevering teacher. If proper care be taken of such a patient the results may be excellent. One of the Nettleship's patients afterwards became a lawyer. But there are cases where a considerable degree of defect exists and these should be no longer tortured with reading, if proper teaching does not effect any improvement. They should be developed in other directions. G. F. Rochat.

(2) Stephenson adds two new cases to the growing list of patients affected with congenital word-blindness (Hinshelwood). The first patient, an intelligent lad of nine years, experienced unusual difficulty in learning to spell and to read, and figures, also, gave him much trouble. Sight was practically normal. 1.50 D. of hypermetropia. Fundi normal; fields of vision for white full. After six months' special tuition, considerable progress had been made with reading. The second patient, a boy aged ten years, who suffered from "habit-spasm," had experienced great difficulty in learning to read letters or figures. There was a considerable amount of hypermetropic astigmatism, after the correction of which sight equalled one-half. The patient's auditory memory was exceptionally good, so that he could quickly get by rote anything he heard. Commenting upon the sixteen cases so far published of this curious developmental defect, Stephenson insists that the condition is far from uncommon, and he agrees with Hinshelwood and Lechner in thinking it to be due to a congenital defect in the visual memory center for words and letters. Eighty-two per cent. of the cases have been met with in males. The average age of the reported cases was thirteen years. Some of the patients have evidently been of a neuropathic disposition. The general intelligence was highly developed in most of the patients. Stephenson believes that under suitable

methods of education, considerable improvement can be effected in children with congenital word-blindness. A bibliography is appended to the communication.

GEORGE CARPENTER.

(3) Bruner reports an instance of congenital word-blindness in a lad, aged nine years, whose general development, mental as well as physical, had been somewhat slow. He had no particular trouble in learning the alphabet, but had made extremely slow progress in learning how to read. The difficulty in reading had been just as great with large as with small print. The boy experienced considerable difficulty with written arithmetic but none with mental arithmetic. He was endowed with an excellent memory. V. normal, not improved with any glass. Under separate tuition there was considerable improvement in reading in the course of about sixteen months. The author abstracts the cases of this curious congenital condition described by Hinshelwood, Nettleship, and Wernicke.

Exanthemata Following the Inection of Diphtheria Antitoxin.—OBERWINTER (Deutsch. med. Woch., Dec. 31, 1904; Med. News) says that an eruption appearing between the third and fifth day should be viewed with the greatest suspicion, as he has found that in most cases it was due to genuine scarlet fever, and that therefore there was a dual infection from the commencement.

Modern Pediatrics.—ESCHERICH (Am. Med.) reviews the various steps taken by pediatrics in its development into science, and which have considerably extended and clarified the study of pediatrics. Modern pediatrics exhibits a scientific structure including all disturbances of the life processes, arranged according to scientific principles, and in its completeness not reached by any other specialty in medicine. Only a small number of diseases can be considered peculiar to childhood, because they are caused by events which cannot occur in the life of adults, such as the change from intrauterine to extranterine life, and growth and development. The key to the understanding of the special pathology of the infantile organism is to be found in the study of developmental processes. Between the growing organism of the child and that of the completely-developed adult great differences exist in the reaction called forth by the diseased process, the variations which change constantly in the course of childhood. The author also considers the threefold division of childhood accepted by Vierordt, which he accepts as the most scientific as well as practical.

The Danger of Scarlet Fever Desquamation.—E. J. POYNTON, M.D., F.R.C.P. (British Med. Journal, Feb. 4, 1905), in a clinical lecture on some points in the differential diagnosis of scarlet fever, German measles, and measles, has this to say: "It is in considering this side of the question that the old difficulty crops up, as to how long the patient is infectious and as to what is the danger of the desquamation. If the following be authentic, desquamation may be very dangerous. In the spring of 1900, a family in Texas suffered from severe scarlet fever and during desquamation whole casts of fingers and toes came away. The mother collected these and put them in a cardboard box. The family then moved from the neighborhood, and in February, 1901, was visited by another family, consisting of father, mother, and a little boy aged three years. The mothers fell a-talking and the hostess produced the box of scales as a trophy. Four days after this the little boy sickened with scarlet fever and died.

His aunt and her three children came to see him when he was ill and also an uncle with his little boy. All these children died from scarlet fever. There was no other case of scarlet fever and none in the neighborhood. I cannot vouch for this, but it was reported by Dr. Fowler, of Pottsville, Texas, and attention was drawn to it by Dr. Gresham in the Lancet, June 11, 1904. Its importance is clear, for whenever nowadays an attempt is made to show that peeling in the late stage is a source of danger, it must also be shown that there are no nasal or aural discharges. The cardboard box had neither nose nor ears.

Again, Dr. Rotch in the last edition of his treatise on children, gives the following case: A boy aged six years and a girl aged four years slept with their beds touching. On May 1 the boy was taken ill but remained in the same room with his sister for the next twenty-four hours. The girl—as the boy was found to have scarlet fever—was sent away into the country and all lines of communication were cut. Until June 1 all went well and the boy was desquamating freely. On June 1 the little girl sickened with scarlet fever and Dr. Rotch found that the little boy had written to her and that she had put the letter under her pillow. Dr. Rotch adds: A careful study of this case led to but one conclusion—that the boy during the period of his desquamation had infected his sister at a distance of twenty miles by enclosing the contagion of scarlet fever in an envelope. These are two interesting cases, for it is difficult to get an evidence for or against the danger of the desquamation of scarlet fever.

The Finger Tips in Congenital and Chronic Heart and Lung Disease and in Pulmonary Osteoarthropathy, Respectively.—D. J. MILLER (Archives of Pediatrics, Mar., 1905, Vol. XXII, No. 3) says that in the clubbing of the fingers in chronic heart and lung conditions, the enlargement is lateral and palmar, whilst in pulmonary osteoarthropathy the enlargement is anteroposterior and dorsal (parrot-beaked). A further distinction is, that in the former, the nail is apt to be blue and cyanosed, whilst in the latter, the nail is rose red and often striated and brittle, so that it splits readily. These differential nail signs are of great significance.

The Acute Pyelitis of Infancy.—R. G. FREEMAN (Archives of Pediatrics, Mar., 1905, Vol. XXII, No. 3) draws attention to a condition that is often overlooked, especially where in cases similar to the one reported by him, the infant is suffering from gastroenteric disorder. In the discussion that followed the reading of Freeman's paper, Dr. Morse made use of a new and most true clinical aphorism when he said, "The frequency with which the condition (pyelitis) is met with, depends upon the frequency with which we examine the urine."

In our district where malaria is so prevalent, it is well to remember that a condition in infants resembling malaria is often due to acute pyelitis. Pus in an acid urine would clinch the diagnosis.

Paralysis of the Diaphragm (Diphtheritic).—W. P. NORTHUP (Archives of Pediatrics, Mar., 1905, Vol. XXII, No. 3) in describing the signs of paralysis of the diaphragm, is very happy in saying "on inspiration, the liver and the epigastric contents slid up under the ribs, were aspirated upwards, carrying the diaphragm with them." This is a clinical description which for its clearness and significance can not be too highly praised.

Intestinal Antiseptics and Disinfectants in the Treatment of Infantile Gastroenteric Diseases.—G. MYA (Rivista di Clin. Pediatr., Sept., 1904, p. 641). The author rejects all antiseptics in the treatment of gastroenteritis in children, and gives as his reason the old objection, that the amount of antiseptic that can be safely given is absurdly inadequate to the amount of disinfection to be accomplished.

Early Operation in Appendicitis with a Special Consideration of Appendicitis in Childhood.—HEINRICH ALAPY (Arch. f. Kinderh , Vol. XXXVIII, p. 241, 1904) lays stress on three cardinal symptoms in the early diagnosis of appendicitis: (1) Spontaneous pain. (2) Hyperesthesia (tenderness on pressure). (3) Muscle spasm. He emphasizes the fact that appendicitis in children is graver than in adults, and says a conservative attitude is not justifiable and that operative treatment should more frequently be resorted to. (Ref. Archives of Pediatrics.)

Hematemesis and Melena in an Infant Two Days Old. Recovery.—Hemorrhages of the new born are always puzzling and the above case as reported by B. MORRIS and M. FELDMAN

(British Med. Journ., Feb. 18, 1905), is of great interest: On December 4, 1904, they were called to see a child, twenty-four hours old, which five hours previous to their visit had been attacked by severe vomiting of blood. It brought up about a tablespoonful of blood every hour, the attack being provoked by feeding. In the first attack the blood was of a chocolate color and partly coagulated. In the following attacks, which they had an opportunity to witness, the blood was of a bright red color and contained no air bubbles. The color of the stools was at first that of meconium, but was afterwards altered by the appearance of blood, which also stained the napkins.

The child was fairly well developed and, but for the subnormal temperature (97 degrees F.), did not at the time appear very much worse for the loss of blood. The fontanelle was not depressed and the heartbeats were regular. The mucous membranes did not look pale and did not bleed. There was no icterus and no history of syphilis, phthisis, or hemophilia. The pharynx and tonsils were of normal appearance. There was no epistaxis and there were no fissures in the mother's nipples.

The suggestion as to the causes of melena neonatorum are as follows: (1) Hyperemia of the mucous membrane of the alimentary canal, due to sudden occlusion of the umbilical arteries brought about by too early ligature of the umbilical cord. (Kiwisch.) As, however, in the above case the cord was tied a good many minutes after the child was born, this hypothesis is untenable here. (2) Thrombosis of the umbilical vein by ligature of the cord before respiration has been fully established. (Landau.) (3) Congenital absence of the common bile duct. (Wickham Legge.) (4) The swallowing of blood from the maternal passages during parturition. (5) Infectious in origin and therefore febrile. (6) Gastric ulcer.

The authors incline to the belief that gastric ulcer was the cause of the hematemesis and melena, as the attacks followed immediately after feeding and yielded to the ordinary treatment for gastric ulcer.

Precocious Menstruation with Ovarian Sarcoma.—H. Riedl (Wien. Klin. Woch., Sept. 1, p. 942).—A girl, born on Jan 22, 1898, was admitted to hospital on Mar. 21, 1904. She was a weakly baby but soon developed rapidly. Early in her fourth year there was hemorrhage from the vagina, and this had since recurred fairly regularly every 3 months, the flow lasting 3 or 4 days. The last menstruation occurred just before January, 1904. During 4 months before admission she frequently complained of pains in the left iliac region, and the abdomen gradually enlarged. During the last week the abdominal pain had been exceedingly severe, and all food was vomited. Neither flatus nor feces were passed and enemata had no effect. There was rapidly increasing abdominal distention.

Her height was nearly 4 ft. (121 cm.). The breasts were slightly prominent (3 1-5 in. in diameter) and the nipples were prominent and surrounded by brown pigmented areaolæ. The axiliary hair was scanty, but on the mons Veneris and the edges of the well-developed labia majora the hair was thick and long. The abdomen was tense and prominent and diffusely pigmented. At the level of the umbilicus was a shallow oblique depression. The hymen was intact. Palpation of the abdomen revealed a hard, somewhat tender tumor, which extended from the pelvis to above the level of the umbilicus and occupied both flanks. Over it there was absolute dulness. Per rectum the cervix could be felt in the middle line, and above and on either side a hard tumor which completely filled the true pelvis. The temperature ranged between 98.6 degrees and 99.6 degrees, and the pulse between 110 and 125.

Laparotomy was performed on Mar. 23. A glistening, bluish, and partially cystic tumor was exposed. Superiorly it was adherent to the great omentum, and on the left side to the intestine. It was freed from adhesions and, after ligature of the left broad ligament close to the uterus, removed. The stump was covered with adjacent peritoneum. The tumor appeared to have replaced the left ovary. The right ovary was small and contained a few minute cysts. The uterus corresponded in size to that of a girl of 17. A drainage tube was placed in Douglas's pouch, the abdominal wound was closed, and 35 oz. of normal saline solution were injected subcutaneously. The drain was removed on the following day and recovery was rapid. Between March 26 and 28 there was a hemorrhagic vaginal discharge. She left hospital on April 17, weighing 50¾ lbs.

The tumor was the size of a man's head and weighed 5½ lbs. It was a round-celled, medullary sarcoma with numerous cysts formed by a process of disintegration and containing a brownish, viscid fluid—a typical juvenile ovarian sarcoma.

She was seen again in July. In the course of the cicatrix several sutures were in process of extrusion (the wound had been closed layer by layer), and the child complained of occasional pain in the right hypogastric region. There was a hard, tender, fixed, uneven tumor behind the left pubic bone, which was of the size of a goose's egg, and ascended above the pelvis. Towards the middle line, in its immediate vicinity, were some smaller nodules. To the left of the rectum an ill-defined swelling was felt. The child's appearance was good, but there was evidently recurrence of the sarcoma. Menstruation had not occurred since she left the hospital.

In several published cases precocity has been complicated by ovarian tumors.

(1) A girl first menstruated at 3½ years. There was great development of black pubic hair and of the breasts. Post mortem, sarcoma of the ovaries was found (Bevern, in Hufeland's Journal, Vol. XIV., p. 141, 1802).

(2) A girl began to menstruate at 7 years. The genitals were covered with lanugo-like hair, and the breasts were unusually developed. Post mortem, a steatoma and hydatids of the ovaries were found (Gaedicke, in Horn's Archiv, p. 189).

(3) A girl, aged 2, first menstruated at 19 months. The genitals were covered with hair, and the breasts resembled those of a woman. She died of ovarian sarcoma (Geinitz in Würzburg. Med. Zeitschr., Vol. III, p. 322, 1862).

In other cases of sexual precocity there have been rickets, obesity, or hydrocephalus. These facts tend to support Hofacker's view that precocious puberty in the female is pathological.

Roger Williams collected 11 cases of precocious puberty in females associated with ovarian tumors (see "Review," Vol. V, p. 582).

Cerebro-Spinal Meningitis.—(British Medical Journal, April 8, 1905). The epidemic of cerebro-spinal meningitis in New York has assumed serious proportions. It began early in the present year and has been increasing in violence ever since, one hundred and forty-eight deaths from the disease being recorded during the week ending on April 1. Comparing the present epidemic with that which occurred in New York in 1872 and lasted ten months, it appears that the deaths recorded this year already exceed the number in the whole of that period. The number since January 1 is 798. The disease has also appeared as an epidemic in Silesia; cases have occurred also in Saxony and other parts of Germany, and a few in the suburbs of Berlin.

Cerebro-spinal meningitis has been recognized as a distinct epidemic disease since the beginning of the last century. A small outbreak in Geneva in 1805 was described by Vieusseux, and in 1806 and during the succeeding years several epidemics occurred in America and attracted considerable attention. According to Hirsch, the earlier outbreaks of the disease in various parts of the world may be divided into three groups: the first from 1805 to 1830, when the main incidence of the disease was in the United States; the second from 1837 to 1850, when the disease was severely felt in France, and a few outbreaks also occurred in America; the third from 1854 to 1874, when neither Europe nor America was free from the disease, and the latter country suffered from several extensive epidemics. Since 1874 the disease has broken out in many parts of America. A severe outbreak occurred in Maryland in 1892 and in New York in 1893, and in 1896 and subsequent years Boston and its neighboring towns also suffered from it.

About the bacteriology of the disease a good deal is known, though the subject cannot as yet be said to have been completely elucidated. The organism most frequently associated with the infection is the diplococcus intracellularis meningitidis, which was described by Weichselbaum in 1887. Weichselbaum found it in the purulent exudate from cases of the disease, and affirmed the constancy of its presence in sections of the brain and its membranes. Councilman and others have considerably strengthened the value of Weichselbaum's discovery by an extended series of observations, being able to demonstrate the diplococci by culture or by microscopic examination in 38 cases out of 55. Osler, again, states that in a Boston outbreak, where post-mortem examinations were made of 35 cases, the diplococci were demonstrated in all but four; in one of these four they had previously been found in fluid withdrawn by lumbar puncture, and the other three were chronic.

Considering all the evidence available, there seems to be no doubt that this diplococcus is the causal agent in a very considerable proportion of cases of the disease at least, though we are not justified in assuming that cerebro-spinal meningitis is always and necessarily due to this organism. Other bacteria which have occasionally been found in association with the disease are the pneumococcus and Friedländer's bacillus.

With regard to the detection of the organism during life, the fact that it has very frequently been identified in the cerebro-spinal fluid withdrawn by lumbar puncture makes this method of examination a highly important aid to diagnosis. Little is known about the channels by which infection with the diplococcus meningitidis actually takes place, but some interesting observations have been made which lend support to the hypothesis that it may gain access to the brain directly by the nasal, auditory, or other passages. Scherer has found it twice in the nose in coryza; it has been found in the conjunctiva by Carl Fränkel and Axenfeld; and Jäger has observed it in the purulent discharges of rhinitis and otitis. The distribution of the organism in nature is not known.

The disease, according to Professor Osler, does not seem to be directly contagious, and is probably not transmitted by clothing or the excretions. How any particular epidemic arises it is, in the present state of our knowledge, extremely difficult to understand; but in view of the fact that outbreaks are generally localized and rarely very widespread, the risks of an importation of the disease into this country from the other side of the Atlantic do not appear to be very considerable.

In view of the prevalence of cerebro-spinal meningitis in New York, Dr. Darlington, head of the Health Board, has appointed a Commission to investigate the disease and devise means of cure or prevention. The members of the Commission are Dr. William M. Polk, Dean of Cornell Medical College (chairman); Dr. Walter B. James, Professor in the New York College of Physicians and Surgeons; Dr. William P. Northrup, Professor of Children's Diseases in the University of Bellevue Hospital Medical College; Dr. Simon Flexner, of the Rockefeller Institute; Dr. Joshua M. Van Cott, Pathologist to the Long Island Medical College; Dr. E. K. Dunham, Pathologist of the Carnegie Laboratory, and Dr. William K. Draper, visiting physician at Bellevue and Minturn Hospitals (secretary). Dr. Darlington's choice was determined by the facts that each of these physicians is a recognized authority in medicine, and that taken together they represent all the medical colleges of New York and will have the advantage of the laboratory work of those institutions. The Commission has already begun its work. It will issue cards to medical officers of hospitals, with blanks to be filled in with data as to cerebro-spinal meningitis. The schedule includes questions as to the evidences from the bacteriological standpoint of communicability and as to the biology of the disease bacilli, with reference to differentiation, agglutination, and pathogenesis. They further inquire as to the effect of drying on the bacilli and their viability in spray, as bearing on isolation and infection. Complete information about the patients' surroundings and the conditions under which they were stricken with the disease will also be collected. It is probable that the scope of the investigation will be world-wide, and that information will be sought from hospitals all over the globe. All the members give their services free, while the £1,000 appropriated by the city will go toward defraying the expense of compiling data. This Commission is the second that has been appointed in New York within twelve months. The Pneumonia Commission appointed last year is still at work, but expects to publish the results of its labors in a short time.

Alopecia Universalis.—(Brit. Med. Journ., Apr. 8, 1905). At a meeting of the Society for the Study of Disease in Children held on March 17, Dr. Leonard Guthrie in the chair, Dr. O. Grünbaum showed a boy, aged nine, with alopecia universalis. The hair of the head began to come out two years ago, and complete baldness resulted in a year. Then the eyebrows and eyelashes seemed to fade away. The nails were normal. Mr. G. Pernet advised liberal diet, tonics, thyroid extract, and stimulating lotions. Dr. R. Hutchinson exhibited a case of late rickets in a boy of nine years. He had rickets at the age of three years, and had never completely recovered. For some months the legs had been gradually bending. There was marked epiphyseal enlargement of the lower ends of the radius and ulna, of the knee joints, and of the ankles, with typical rickety curvature of the femora and tibiæ. The skull, chest, and viscera showed no changes. Mr. S. Stephenson showed a boy, aged nine, with tuberculosis of the lachrymal sac. Tubercle bacilli were found in scrapings from the interior of the diseased sac. The boy was previously operated on for enlarged nasal chambers, probably tuberculous. Mr. Stephenson also showed a typical case of keratomalacia in a girl of eight months. The condition was one of sloughing of the cornea in a young child suffering from marasmus. The eyes were kept shut, and the corneæ were converted into greyish-white sloughs. The disease corresponded, he said, with "hikan," an epidemic disease of Japan, with the ophthalmia Braziliana of South America, and with the destructive keratitis common in Russia during the great Lenten fast. Dr. J. Charlton Briscoe showed a girl, aged thirteen years, with tremor of the right arm, very rapid, better felt than seen. It was absent during sleep, constant while awake, increased after exertion, and diminished after rest in bed. The muscles of the forearm and hand were not involved, and no other change was present. The onset was sudden, three months ago, with anorexia and lassitude. Dr. L. Guthrie suggested mild encephalitis or thrombosis of some of the finer vessels of the left cortex as possible causes. Dr. G. Sutherland regarded the condition as "functional," a diagnosis with which Dr. Briscoe agreed. Dr. F. Parkes Weber showed a child, aged twelve years, with jaundice and very considerable enlargement of the spleen. The lymph glands were not enlarged, and the blood showed nothing abnormal. The mother had had six stillborn children. Mr. J. Howell Evans showed a case of osteoma of the pregmatic Wormian bone. Mr. G. F. Hett showed a child with tuberculosis of the lungs, cervical glands, and ears. It was discussed by Dr. Carre-Smith, Dr. Sutherland, Mr. Howell Evans, and others.

Lumbar Puncture in Pertussis.—M. BERTOLOTTI (Gazz. Med. Ital., February 16th, 1905) states that recent researches into the characters of the cerebro-spinal fluid have shown that the symptoms formerly ascribed to meingismus are those of a mild form of meningitis, and that meningitis is often present when there are no symptoms clearly pointing to the spinal membranes as the seat of disease. Lumbar puncture is particularly safe in the case of children, because the yielding character of the bones allows the atmospheric pressure to supply the support necessarily withdrawn from the central nervous system when the fluid is removed. It is necessary to make the puncture with a small needle, as the dura mater is not elastic, and the insertion of a large needle may lead to persistent draining away of fluid. Bertolotti describes his own method of puncture in the median line, which he regards as decidedly superior to Quincke's lateral puncture. The needle, no larger than an ordinary exploring needle, is inserted exactly in the middle line between the apophyses of the third and fourth lumbar vertebrae, piercing the interspinous ligament (in childhood a soft and yielding structure), and then passing onwards and a little upwards through the interlaminar ligament and into the vertebral canal. The perforation of the interspinous ligament is neither painful nor dangerous. The author was led to examine the cerebro-spinal fluid in pertussis by the consideration that pertussis is a constitutional malady with a specific virus which provokes in the hematopoietic system an intense reaction. Three cases are quoted. In the first, a child of three years, fits of coughing were violent, and did not yield to treatment. After a few days the pulse became slow (61 to 68). The pupils were somewhat unequal, and the temperature fell below normal. Though there were none of the classical symptoms of meningitis, it was decided to make a lumbar puncture. The fluid was under considerable tension, and came out in a jet. It was perfectly limpid, and did not coagulate. Examined microscopically, it contained 30 to 40 large mononuclear cells in the field of vision, elements exactly similar to those described by Muggia and Bertolotti as characteristic of the blood of children suffering from pertussis. In this case the blood count showed 10 per cent. of polynuclears and 80 per cent. of large mononuclears. Lumbar puncture was performed three times in a fortnight, and each operation was followed by very well-marked temporary improvement. The patient recovered. The second patient had frequent fits of coughing, headache, torpor, malnutrition, and slow pulse. The fluid was not found to be under excessive tension. Six or seven c.cm. were extracted and centrifugalized, the sediment showing five to ten mononuclears and lymphocytes in the field. A satisfactory recovery was made, apparently unaffected by the puncture. The object gained was the demonstration of a specific meningeal irritation. The third patient—a child aged two years—had strongly-dilated pupils reacting badly to light and accommodation, slight inequality of pupils, and very slow pulse. The cerebro-spinal fluid was found to be under decided hypertension. Its microscopical characters were like those of the last specimen described. The puncture was followed by relief of symptoms. These cases established the existence of a specific meningeal irritation as a complication of pertussis. In the first case especially the meningeal reaction had an evolution exactly parallel with that of the pertussis. The author suggests that the cerebro-spinal fluid is, in such cases as these, the vehicle by which the virus of pertussis acts on the central nervous system, and especially on the bulb and cerebrum, for in all the cases quoted the symptoms of spinal meningitis were conspicuously absent.

Phimosis in Infancy and Childhood.—C. G. Russman (Am. Pract. and News) says that phimosis is usually congenital, but may arise from inflammation. The degree of phimosis varies greatly. The preputial opening may be so small that no part of the glans can be exposed, and in rare cases the orifice is completely closed.

Phimosis may produce results worthy of serious consideration. The smegma that accumulates under the prepuce behind the corona glandis and forms a hard band around the organ produces intense irritation and gives rise to reflex nervous disturbances and other symptoms—insomnia, night terrors, etc. The irritation beneath the prepuce induces the child to pull or rub at the penis in the attempt to obtain relief, and the sensations experienced frequently result in masturbation. Balanitis is also excited and in some instances pus forms. The consequence of straining, induced by phimosis, may lead to hernia—most frequently umbilical, less so inguinal. Straining also leads to prolapsus ani, and hydrocele, from pressure on the spermatic vessels. Urethritis may be a complication. Irritability of the bladder may be induced, or enuresis, frequent micturition and dysuria. In consequence of the prevention of the free escape of urine, the distal portion of the prepuce becomes more and more ballooned out. If, in such cases, the prepuce becomes swollen by inflammatory process, complete retention of urine may result. The physician should note in every new-born infant the condition of the prepuce; if it is adherent and the orifice small, it should receive his immediate attention, for trouble will arise sooner or later if neglected. The author advises taking a pair of small artery forceps and stretching the foreskin; if adhesions are present, dissect back or forcibly retract the prepuce over glans, sponge out semegma if present, and apply a little vasoline and draw skin forward; then instruct nurse or mother to cleanse daily, giving explicit instructions to draw foreskin forward to prevent paraphinosis. Another simple plan is to slit up the dorsum of the prepuce with a pair of scissors or with a knife, use groved director as a guide to prevent injury to urethra, trim off the sharp corners and put suture or two on either side. This is very easily done and gives excellent results. For extremely long prepuce or in older children circumcision is to be recommended.

Cardiac Disturbances in Scarlatina.—Dr. Schmaltz (Muench. Med. Wochenschr., No. 32, 1904) says that cardiac disturbances are quite commonly met in scarlatina. Among 191 cases under observation the author found 65 presenting circulatory disturbances. A systolic murmur is frequently heard by the end of the first, second or third week of the disease. Less frequently the murmur appears later. The murmur either disappears after a few days or becomes more pronounced after evanescence of the fever. Often the murmur is associated and for some time preceded by accentuation of the second pulmonary sound. Arhythmia also is not infrequent. The clinical picture is very valuable. Apparently mild disturbances may for want of proper attention terminate in grave affections. The subjective symptoms are generally not severe. The course of the heart affection varies greatly. The author observed no fatal issue among his cases. He was able to follow up the course of the disease in 29 cases for over a year. In 16 cases there remained permanent mitral insufficiency, in the others a systolic murmur of variable intensity. From observations made on children who succumbed to scarlet fever the author is led to believe that the anatomical basis for the cardiac complications is chiefly myocarditis. Prolonged rest in bed is the most effective remedy for the prevention as well as cure of the cardiac disturbances.

The Cardiac Area in Childhood.—Dr. B. Guido (La Pediat. Ref., Briti. Jour. of Child. Dis., Vol. I, No. 12) makes the following suggestions:

1. Cardiac percussion in children should be light, trusting more to the resistance perceptible to the touch rather than to the ear.
2. In the very young the heart is very high (second space), its position and direction almost horizontal, the apex 1 to 2, or even 3, centimeters, outside the mid-clavicular line.
3. With increasing age the heart becomes lower (third space) and assumes a position and direction more vertical, the apex approaches the mid-clavicular line, and about the seventh year coincides with the nipple; subsequently it is found below and inside of it.
4. From birth to the second year of life the heart undergoes rapid enlargement, then moderately increases in size to the ninth or ten year, when it undergoes a further rapid development on account of the ever-increasing exigencies of the organism in response to the development of the genital system which is initiated at this age.
5. The area of absolute dulness, which in the child is always relatively larger than in the adult, should be investigated in every case, together with the relative dulness; this method only giving reliable information.

The Effect of Formalin on Milk.—Dr. C. S. Engel (Zschr. f. Aerztliche Fortbr., No. 1, 1905) after extensive experiments at the Institute for Infectious Diseases, has arrived at the conclusion that although the addition of formulin arrests the growth of bacteria in milk for the first two days, their development is hastened after that period at room temperature. Furthermore formalin interferes with the coagulation of the milk and has a detrimental effect upon the digestive apparatus.

Sudden Death in Children, with Especial Reference to the So-Called "Eczema-Death."—Dr. E. Feer (Ref., Der. Kinderarzt., XVI, No. 3, 1905), says that the pathological conditions underlying sudden death in children are chiefly spasmus glottidis, acute enlargement of the thymus, status lymphaticus and certain eczematous lesions of infancy. The author had the opportunity to observe eight cases of the so-called "eczema-death" at the children's hospital at Basel, and 14 more cases under the care of other physicians. Post-mortem examinations revealed that in the majority of cases status lymphaticus was present, namely, in 10 children at the age of from six to 12 months. The author looks upon eczema as a dyscrasia, a constitutional affection favored by local causes. The close relationship between scrofula and status lymphaticus and between the former and eczema seems to support this assumption.

BOOK REVIEWS

The Summer Diarrheas of Infants. By H. Illoway, M.D. E. R. Pelton, New York.

In his introduction to this little volume Dr. Illoway speaks of the confused ideas as to the etiology, pathology and treatment of those disorders known as summer diarrheas, and points out the lack of logic in classifying as such diarrheas due to causes which would be operative at any time of year. He limits the term to those in which the heat of the season is the etiological factor, and classifies them under three heads, heat stroke, summer complaint and cholera infantum. The diagnosis and treatment of these he takes up separately.

Traité d'Hygiene et de Pathologie du Nourrisson et des Enfants du Premier Age. Poublie sous la Direction du Dr. Henri de Rothchild. Tome D' Euxième. Octave Din. Paris, 1905.

Over 700 pages are to be found in this second volume of this magnificent work. Diseases of the nose, the larynx and the ear are treated by Dr. Pierre Bonnier; those of the eye by Dr. Alph. Péchin. Cutaneous Hygiene and Pathology is written by Dr. Paul Gaston, while Drs. M. Roques, P. Audion, L. Brunier, M. Perret and P. Ehrhardt write on the Diseases of the Respiratory Organs. Dr. M. Perret also contributes a chapter on Diseases of the Heart. Diseases of the Liver and of the Spleen are discussed by Dr. Lèon Kahn, and this volume closes with a description of the Peritoneal Affections by Dr. Marcel Deschamps.

Certainly little can be desired that is not fulfilled by this monumental volume.

PUBLISHERS' ANNOUNCEMENTS

INTESTINAL DISORDERS DUE TO LACK OF NORMAL INTESTINAL ALKALINES.

At this period of the year we are called upon to consider carefully the application of therapeutic measures to be adopted in the treatment of disease of the gastro-intestinal tract. Conditions met in these cases have a marked degree of similarity, due primarily to a faulty or altered secretion of intestinal juices, and secondarily through errors of diet, etc. The contents of the bowel are found to be made up of a fermenting mass of decomposed food, broken down mucous membrane, together with fluids of intensely acid reaction loaded with pathogenic bacteria. The logical treatment indicated would call for a prompt removal of the source of infection and the restoration of normal secretion.

A prominent practitioner in the south, whose wide experience justifies authority, recently embodied in a paper the following statement: "In diseases of the intestinal tract in children or adults, whatever the diagnosis may be, we always trace the origin of the troubles to a want of alkalines to correct an excess of acidity during the digestive process." This is of deep interest to us as it gives the key to the marked results following the administration of the alkaline antiseptic, Glyco-Thymoline, which not only corrects existing hyperacidity with its concomitant symptoms, but causes by its exosmotic property a rapid depletion of the engorged membrane and a stimulation of the glandular system to normality, whereby the proper amount of alkaline fluids will be secreted. Therefore it is well to remember that Glyco-Thymoline not only corrects the effects of disease but aims to reestablish those processes of digestion and assimilation which are wanting.

In severe cases of cholera infantum, dysentery, ileo-colitis, etc., the solution should be administered as a colon flush, using a 10 per cent. solution of about 100 degrees F. This treatment combined with ʒi to ʒii doses per oram serves to rapidly eliminate all toxins, promote an aseptic condition of the bowel and to encourage what is most needed—the secretion of normal alkalines.

PEDIATRICS

Vol. XVII JULY, 1905 No. 7

ORIGINAL ARTICLES

A CASE OF SYPHILITIC PSEUDOPARALYSIS[1]

By Jacob Sobel, M.D.,
of New York.

The osseous changes common to hereditary syphilis are most frequently manifested in the form of a diaphyso-epiphyseal lesion, that is, an osteochondritis of the femur, humerus, tibia, radius or ulna. This manifestation, when associated with other signs of congenital lues admits, as a rule, of a ready diagnosis, but when present as an initial symptom, so to say, it renders a diagnosis not only very difficult, but at times impossible, for some period. The following is a case in point:

Case.—Helen Z., aged three weeks, bottle-fed since birth, was brought to my dispensary service at Lebanon Hospital on December 1, 1904, with a history that for the past four days the child does not seem able to move its left arm. The child was apparently well until four days ago, when some friends who were visiting the house played with it and pulled the arm, as the guardian thought. The patient was the first-born. The labor was normal and in-so-far as the guardian knew, the parents were healthy. At the first visit both my associate and myself paid particular attention to the examination of the left upper extremity, examining carefully the clavicle, shoulder, elbow, wrist and hand; we found no subluxation, no fracture, no dislocation, no swelling of any kind. There was, however, a drop-wrist with its characteristic deformity and disability. Tickling of the palm caused slight movement of the fingers. No callus pressing on the musculo-spinal nerve could be detected, nor was there pain on pressure over any of the joints. In addition to the drop-wrist there was a slight inward rotation of the arm suggesting the upper arm type of birth paralysis, but the fact that the condition had appeared during the third week of life, and that there was no atrophy, ruled out Erb's paralysis.

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[1] Presented at the Pediatric Section, Academy of Medicine, Feb. 16, 905.

A physical examination of the patient at this time was absolutely negative, not even a palpable liver or spleen. A tentative diagnosis of traumatic neuritis was then made, and gentle massage with cocoa butter and rest were ordered. The guardian returned on two subsequent visits, two or three days apart, to report some improvement; on both of the latter visits, examination of the extremity and especially of the wrist-joint revealed nothing except some slight pain on passive movement. All other joints were free and painless and the gums were normal. There were no evidences of rickets. On December 10 there was detected a distinct crepitation of the lower end of the radius and ulna, at the junction of the epiphysis and diaphysis—an epiphyseal separation; the case was then transferred to the surgical service. One week later the face was partially covered with a papulopustular eruption, with adherent crusts here and there, especially around the mouth; the crusts resembled those of impetigo contagiosa but were easily differentiated by their sitution upon a copper-hued base; the body showed a maculopapular ham-colored eruption and the skin of the soles and palms was desquamating and thickened; there were decided coryza, snuffles, mouth breathing, fissured lips, in a word, the clinical picture of congenital lues. The spleen and liver at this time were distinctly palpable. Then the diagnosis of the original condition became clear of course and the cause for the pseudoparalysis became very evident. Subsequently distinct anal condylomata made their appearance. The forearm was immobilized with lateral splints by Dr. Reiss, the surgeon in charge, and the lues was treated in the dermatological service of Dr. Gottheil, by the administration of calomel gr. 1/20 to 1/10 three times daily and by the twice daily application to the umbilical region of a pea-sized piece of white precipate ointment covered with a flannel abdominal band.

In three and a half weeks no false point of motion or crepitation was detected and in four and a half weeks the surgical aspect of the case was closed. Under the aforementioned anti-specific treatment rapid improvement was made.

It seems to me that the sequence of events in this case—pseudoparalysis (epiphysitis), epiphyseal separation, and lastly the cutaneous outbreak, is interesting and instructive and warns us to be on our guard in diagnosticating mono-articular involvements in young children. When brought face to face with a similar case in the future, after excluding trauma, fracture, sepsis, perhaps infantile scurvy, it may be well to turn our thoughts to the possibility of osteochondritis epiphysaria luetica neonatorum.

THE ANTITOXIN TREATMENT OF DIPHTHERIA, WITH A PLEA FOR RATIONAL DOSAGE IN TREATMENT AND IN IMMUNIZING

By B. Franklin Royer, M.D.
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CHIEF RESIDENT PHYSICIAN, MUNICIPAL HOSPITAL, PHILADELPHIA

(*Continued from June No., page* 358)

All the preceding tables seem to show that antitoxin has reduced the mortality very greatly in all hospitals.

Let us now take up the question of dosage.

From a paper recently read by Dr. Louis Fisher, of New York City (some of you will remember that Dr. Fisher was the first man in the United States to publish a clinical report of the use of antitoxin), I find that the dose he teaches the house officers of the Willard Parker Hospital is very much like that dose in use at the present time in our Municipal Hospital. He feels as we feel, that the proper dose of antitoxin must be somewhat empirical, that it must not be less than will "limit the pseudomembrane, subdue the fever, and check the progress of the disease."

In an abstract from this paper, read before the New York Academy of Medicine, November 10, 1904, published in *Archives of Pediatrics* for December, 1904, I culled the following mortality statistics from the Willard Parker Hospital:

RÉSUMÉ OF CASES REPORTED FROM THE WILLARD PARKER HOSPITAL DURING JULY, AUGUST AND SEPTEMBER, 1903.

	Number.	Died.	Mortality per cent	Recovery.
Tonsillar and pharyngeal	292	34	11.64	38.36
Tube cases	69	42	60.87	39.13

RÉSUMÉ OF CASES REPORTED FROM THE WILLARD PARKER HOSPITAL DURING JULY, AUGUST, SEPTEMBER AND OCTOBER, 1904.

	Number.	Died.	Mortality per cent.	Recovery.
Tonsillar and pharyngeal	253	25	9.84	90.16
Tube cases	115	41	35.65	64.35

"The average dose of antitoxin administered during 1903 was for July 1,500, for August 1,700, and for September 2,500 units; the average dose of antitoxin administered during 1904 was for July 2,500, for August, 5,000, and for September, between 5,000 and 10,000 units. As a result, it has shown about 21 per cent. mortality where the dose was small, against a mortality of 14 per cent. where the larger doses were used."

"For a mild case, from 500 to 5,000 units was used. If there was a large exudate on the tonsils and pharynx, from 5,000 to 10,000 should be given on the first day, and repeated within twelve hours if no improvement is shown. In cases of laryngeal diphtheria, with stenosis, the initial dose should be 10,000 units. He had never seen any case that suffered any ill effect from large doses."

In the discussion which followed the reading of Dr. Fisher's paper, Dr. Park, whom some have learned to look upon as one advocating small doses of antitoxin, had this to say of doses: "In mild cases either early or late, involving tonsils or pharnyx, he uses 2,000 units; in severe early cases 4,000 units; in ordinary laryngeal cases 5,000; in malignant severe cases, tonsillar, pharyngeal, or nasal, 10,000 units, and repeat this dose at the end of ten or twelve hours until the patient is distinctly better."

Dr. McCollom, of the South Department, Boston City Hospital, has long advocated large doses in severe cases.

The following doses are in use at the present time in my wards at the Municipal Hospital:

Purely tonsillar exudate (single), 2,500 units; purely tonsillar exudate (double), 5,000 units. Tonsillar exudate with involvement of pillars and uvula or pharynx, 7,500 to 10,000 units; nasal and any other part involved, 7,500 to 10,000 units; laryngeal, 7,500 to 10,000 units.

Repeat the dose in each case in from twelve to twenty-four hours, depending upon the severity of the disease and the signs of improvement, as shown by general condition and disappearance of exudate. If the exudate is rapidly separating do not give a second dose. Where a great amount of exudate remains give a daily dose of from 5,000 to 7,500 units until the greater portion of it has disappeared. With patients admitted after the seventh day of disease give 2,500 units only. Do not repeat. When patients have remained in the ward six weeks give immunizing dose of 2,500 units.

We give very large doses in naso-pharyngeal diphtheria because we know with pseudomembrane present in this locality toxicity is greater than with it in any other. There is a good anatomic and histologic reason for this increased toxicity. The basement layer of the mucous membrane lining the nasopharynx covering the pharyngeal tonsil and back portion of the uvula is a complete network of lymph channels, ready to open and carry away any absorbable material. In the faucial tonsils and low on the pharynx the lymph channels are less numerous and the fibrous tissue is more abundant, hence less absorption. Then, too, in the nasopharynx you quickly get plugging with damming back into this cavity toxins that from the tonsils might be expectorated. Exudate serum and secretion are firmly held in the naso-pharynx. We give large doses in laryngeal diphtheria because we not only want to neutralize the toxins, but because we must limit the extension of pseudomembrane. We do not give large doses after the seventh day of the disease, because the damage done is irreparable.

Having proven the value of antitoxin, and having shown the reduction in deaths from diphtheria in large cities and in large hospitals, and having shown the tendency to give larger doses, with an argument in favor of doses determined from amount of exudate and location of exudate, we now take up the most vital part, viz., when to give antitoxin. Before deciding when to give it, let us take up the statistics of the Brook Hospital, London, the collected statistics from Chicago, and our own statistics for 1904.

STATISTICS OF THE BROOK HOSPITAL, LONDON.

JOHN MACCOMBIE, Medical Superintendent.

Antitoxin Treatment.—Of 716 completed cases, 610 were treated with antitoxin. The following table shows the result of the antitoxin treatment, with especial reference to the day of disease on which the treatment began:

	Day of disease on which treatment began.												
	1st.		2d.		3d		4th.		5th.		Total.		
Ages.	Deaths.	Cases.	Cases.	Deaths.	Cases.	Deaths.	Cases.	Deaths.	Cases.	Deaths.	Cases.	Deaths.	Percentage mortality.
Under 1	0	0	5	0	3	0	2	2	2	1	9	3	33.3
1 to 2	4	0	2	0	10	4	9	2	12	4	40	10	25.
2 to 3	7	0	11	0	16	5	14	4	21	5	69	14	20.
3 to 4	2	0	20	2	19	6	7	0	22	2	70	10	14.
4 to 5	0	0	16	2	21	3	14	2	27	6	78	13	16.
5 to 10.......	5	0	65	2	66	12	45	6	64	9	245	29	11.
10 to 15	2	0	12	0	23	0	18	2	13	2	68	4	5.
15 to 20	0	0	7	0	7	0	1	0	2	0	17	0	0.
20 and upwards	0	0	3	0	5	0	2	0	4	0	14	0	0.
Total	20	0	141	6	170	30	112	18	167	29	610	83	13.
Percentage mortality	0.0		4.2		17.6		16.07		17.3		13.6		

"For the purpose of comparison I give the results of the antitoxin treatment here for the seven years, 1897 to 1903, inclusive (the figures in brackets are to total number of cases):

	1897	1898	1899	1900	1901	1902	1903
Of cases (187) treated on 1st day of disease the mortality per cent. was..	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Of cases (1,186) treated on 2d day, mirtality per cent. was..............	5.4	5.0	3.8	3.6	4.1	4.6	4.2
Of cases (1,233) treated on 3d day, mortality per cent. was	11.5	14.3	12.2	6.7	11.9	10.5	17.6
Of cases (963) treated on 4th day, mortality per cent. was	19.0	18.1	20.0	14.9	12.4	19.8	16.07
Of cases (1,260 treated on 5th day, and after	21.0	22.5	20.4	21.2	16.6	19.4	17.3

"During the past seven years the total number of cases of diphtheria treated with antitoxin in this hospital has been 4,812. Not a single death has occurred among the cases that came under treatment on the first day of the disease, and among those that came under treatment on the second day the mortality has not exceeded 5.4 per cent., while among those that came under treatment on the third day and later the mortality is much higher. These facts show how eminently curable a disease diphtheria is if treated with antitoxin early enough, and how large a number of lives would be saved if all the cases would be put under antitoxin treatment on the first or second day of the disease."

"In Chicago, between October 5, 1895—date of first case treated—and December 31, 1903, the antitoxin administrators of the department treated 7,435 cases of bacterially verified diphtheria, of which number 479 died—a mortality rate of 6.44 per cent. The average mortality without antitoxin still remains about 35 per cent.

"That the value of antitoxin depends upon its early administration is shown by the following:

"Of the total 7,435 cases, 586 were treated on the first day of the disease, with 2 deaths—mortality rate, 0.34 per cent. Of 1,913 treated on the second day, 28 died—mortality rate 1.46 per cent. Of 2,624 treated on the third day, 85 died—mortality rate, 3.24 per cent. Of 1,374 treated on the fourth day, 148 died—mortality rate, 10.8 per cent. Of 936 first treated later than the fourth day, 216 died—mortality rate, 23.1 per cent.

"There were included in the total 7,435 cases, 608 intubated aryngeal cases, of whom 508 recovered; mortality rate of intubated cases, 16.54 per cent. The former mortality of this class of cases—intubated are tracheotomized—was about 85 per cent."

MUNICIPAL HOSPITAL REPORT FOR 1904.

Day of disease and results.

Day of disease.	Admitted.	Died.	Per cent.
1st day	43	0	00
2d day	220	9	4.09
3d day	153	21	13.72
4th day	114	20	17.54
5th day	61	9	14.75
6th day and over	121	18	14.87
Total	712	77	10.81

Measles, mixed cases and moribund cases dying in 24 hours omitted.

In a recent letter from Dr. John H. McCollom, South Department Boston City Hospital, he makes the following statement:

"Experience has taught me that the golden time for administering antitoxin is during the first twenty-four hours of an attack of diphtheria. I have yet to see a patient die of diphtheria who had antitoxin in sufficiently large doses within twenty-four hours of the commencement of the attack.

"Since the South Department was opened we have had 180 cases of diphtheria among the doctors and nurses, and not a single death, because each patient received a large dose of antitoxin at the outset. I go so far as to say that when a throat has a suspicious appearance it is better to give antitoxin at once and not wait for the result of the culture. Nobody believes more thoroughly than I do in bacteriologic examinations of the throat. Nobody has worked any harder on that line than I have. Nobody has any wider experience than I have. Yet I cannot help feeling that in a given case of diphtheria much valuable time is lost by waiting for the result of the culture.

"I think it is true that patients are coming to the South Department earlier than they did a few years ago. It frequently happens that one member of the family will have an attack of diphtheria and will be treated at home for four or five days, sometimes with antitoxin and sometimes without, and then sent to the hospital as a last resort. The patient is seriously ill and frequently succumbs to the disease. As soon as the other members of the family show any symptoms of sore throat they are at once sent to the hospital, have antitoxin and recover."

The time to give it is when you have clinical evidence of diphtheria. Do not await a culture report; do not wait to see of you will have severe diphtheria. Give it at once.

We very frequently have patients sent to us three, four, or five days in the disease treated by a physician for two or three days and no antitoxin given. I believe that you would find it exceedingly difficult to defend yourself in a court of law proceeding brought against you for neglecting to give such a life-saving agent until the time had passed when it would positively cure your patient.

These statistics in day of the disease require no explanation and no comment. If antitoxin is given early and in an appropriate dose the loss of life will be practically *nil.* If delayed several days the mortality will be very great.

As an immunizing agent, antitoxin is too little used by the profession. It is very common for us to receive at the hospital a patient very ill with diphtheria, and in from two to three days receive a second or third case from the same home. In fact, in a recent experience a child died at home the fifth day of disease without antitoxin, and in three days we received the mother and six children. Not one of these cases should have contracted the disease. All of that suffering and distress would have been saved had the simple, harmless precaution of immunizing those exposed been practiced.

We very often have mothers accompany sick babies to our acute wards and live there. We many times have had sick mothers bring with them nursing babes not suffering with the disease. No precaution is taken and no treatment given beyond immunizing them well. We do not expect them to get the disease. We practically assure them that they cannot get diphtheria if immunized.

Some of you may feel that you will impose upon your clientele too great an expense by this liberal use of serum. I grant you this may be true in certain classes. The Bureau of Health stands ready to supply your patients with antitoxin when they cannot afford to buy it in the market, and should you not care to give it, the Bureau of Health stands ready to send a medical inspector to the home to give it in curative or in immunizing doses as you may direct.

There is no excuse at the present time for neglecting to immunize those exposed to diphtheria. I question if you could defend yourself comfortably in a legal action if you were called upon to prove that you had used "reasonable care" when you had neglected to immunize a family, if those exposed subsequently developed the disease, and the family then proceeded against you.

There seems to be a rational method of dosage even in immunizing. I would recommend for the household 500 units for those not directly exposed, 1,000 units for those directly exposed, and 1,500 units if any sign of illness were present.

I have not yet seen a case of diphtheria develop where a patient had been immunized at the time of exposure or soon after.

In conclusion, I would remind you that in New York City (Manhattan and the Bronx), Brooklyn, Chicago, and Philadelphia, 18,121 lives have been saved through the introduction of antitoxin as a curative and prophylactic agent in the treatment of diphtheria.

The death rate in diphtheria hospitals has been greatly reduced and in many instances cut in half by the introduction of serum therapy. We would plead for a dose of antitoxin in proportion to the amount of exudate and location of the exudate. We would urge a large dose of antitoxin in nasal, nasopharyngeal, and laryngeal diphtheria. We would plead for the general use of antitoxin earlier in the disease. We would plead for more general use of antitoxin as a prophylactic measure in a dose proportionate to the amount of exposure and time of exposure.

LATE RICKETS

By R. W. Marsden, M.D., M.R.C.P., Hon Physician,
Ancoats Hospital, etc.

(*Continued from June No., page* 370)

Macewen[16] gives an account of a clerk who was apparently strong and healthy till fifteen years of age, when he had a severe attack of scarlet fever, which apparently initiated a series of symptoms culminating in marked manifestations of rickets. There is no further statement from which suggestive evidence for or against rickets in infancy can be obtained, and it may be that, from the profound change produced by the severe attack of scarlet fever, this is one of the very rare instances where the most detailed examination would fail to have revealed indications of rickets in infancy; but this point must remain inconclusive.

A consideration of the above cases is, to say the least, suggestive of the fact that in most instances of so-called late rickets there has throughout life been some interference with the normal growth of bone, and calls forth the question whether the evident arrest of development seen in several of the cases, even though unaccompanied by an epiphysial enlargement or bony deformity, may not have been of a rachitic nature. Can it be that the rachitic process is in a sense capable of becoming quiescent: ossification and growth being deficient, but the process insufficiently active to produce the characteristic morphological changes until a further factor is added, e.g., puberty, violent exercise, a severe illness, etc.? It is possible that the use of the Röntgen rays in future cases of defective development may throw some light upon this point. Late rickets being then of an essentially identical nature to infantile rickets, it is evident, as suggested by Clutton, that there may be three possible modes of origin. Thus it may be that it occurs for the first time at the later period of life in an individual previously quite healthy. Secondly, it may be that an attack of rickets in infancy does not completely subside, so that, from defective treatment or superadded cause, a relapse occurs, and the process again becomes active. Thirdly, it is possible that the attack of infantile rickets may completely be recovered from, and after a variable period of normal growth a recurrence takes place. It is evident that, in the present state of our knowledge, cases belonging to type (2) will seldom enter into question; and most writers would agree with Clutton, even though they did not limit, like him, the age of the patients to a definite number of years, that a continuous and clear connection with infantile rickets excludes inclusion in the late variety.

It would seem that Ollier[17] was the first, in 1861, to attribute many of the bony deformities of later childhood and adolescence to rickets, which had previously been considered to be due to osteomalacia. He spoke of a primary form, agreeing with Clutton's first type, and of a secondary form, identical with the latter's third type. In addition, he noted the rarity of the primary form, and pointed out the difficulty of making the diagnosis, on account of the frequent impossibility of proving the absence of rickets in infancy.

I have already dealt with this question; and though not denying the occurrence of the primary form, have suggested that it is still rarer than is usually believed, since, on account of a less limited view of the manifestations requisite for the suspicion, if not the diagnosis, of rickets, I consider it possible that even such apparently typical cases of the primary form as those reported by Clutton, Roos, and myself may in future be shown, by an extended observation through life, with the assistance of the Röntgen rays, to have exhibited previous signs of rachitic changes at the growing ends of the bones.

Deydier[18], a pupil of Ollier, subdivides the latter's classification into a general form, which is rare, and into a local form, in which only one, or a few, regions of the bony skeleton are affected. The local form, he says, is much commoner, and includes the cases of so-called idiopathic genu valgum and varum, as well as scoliosis, which develop in adolescence.

Deydier made the above classification in 1895. Clutton, writing nine years previously, excluded from the heading of late rickets those cases of bending of the bones about puberty or later, which occur without epiphysial enlargement. Such cases he considers to be "due to a want of proper consolidation of the bones in proportion to the increasing weight of the body." He would admit cases, such as the five described by Lucas[19], where, in youths from twelve to seventeen years of age, scoliosis, or genu valgum, was in each instance accompanied by enlargement at the epiphysial ends of one or more of the long bones of the limbs. I have previously stated that, in my opinion, epiphysial enlargement, though of the greatest importance, is not a sufficiently reliable test of the presence or absence of rickets; and this view is strongly supported, if not verified, by the evidence which we possess on the point under consideration.

Mikulicz[20], in 1879, after an extended observation conducted on the lower end of the femur in normal and abnormal cases, found that the whole breadth of the epiphysial cartilage in the frontal section of a normal femur during the period of growth is 1 to 2 mm. On the other hand, in a youth with slight genu valgum, he found that there was a considerable broadening of the epiphysial cartilage. The enlargement especially affected the columnar layer of growing cells, which had a breadth of 2 to 3 mm., whereas in the normal condition it was only one-half mm. Moreover, he states that "the macroscopical and microscopical findings agree so remarkably with the changes which one recognizes as characteristic of rickets, that here we can rightly say there is present a rachitic broadening of the epiphysial cartilage."

Thiersch[21] also reports the case of a girl sixteen years of age of rachitic build, with genu valgum, who died with evidence of advanced contracted kidneys, whilst "the epiphysial cartilage showed the irregular growth which is characteristic (*zukommen*) of rickets."

Others writers, in addition to genu valgum, have included cases of scoliosis and flat foot. Tripier[22] having stated that rickets appears more especially at the times when the normal growth of the skeleton is most rapid, finds that genu valgum is most likely to arise at various ages at which the "height of the conjugating cartilage of the lower extremity of the femur is increased," which he considers, I think erroneously, tantamount to saying that growth in height is more active. He is fully aware "that some writer will object that this greater height of the conjugal cartilage is a rachitic lesion," but he considers that Broca has shown that more than an increase in height is necessary to characterize a rachitic alteration. I have been unable to find this communication by Broca.

Without entering any further into the bibliography of this subject, I think we may accept Macewen's[23] conclusions that osseous deformities of the lower extremities (knock-knees, bow-legs, and various femoral and tibial curves) originate in rickets, since—

(1) Their etiology is identical—some cause of severe and prolonged debility. (2) Rickets and these osseous deformities abound in the same individual. (3) The period of life during which these deformities occur is limited and is identical with the period during which rickets attacks the body—the period of growth. (4) Deformities which are physically identical with those above mentioned arise from rickets, and in the few cases examined the histological characters are the same.

Accepting Ollier's basis, then, for the classification of cases of late rickets, and supplementing Deydier's addition, we may recognize the following types:—(A) A general affection, which may be (1) primary or (2) secondary. (B) A local affection, which may be (1) primary or (2) secondary.

Late rickets being a rare disease, but of an essentially similar or identical nature to the common infantile form, it is natural to inquire whether its supervention throws any light upon the much disputed pathology of the rachitic process.

I think it may be safely asserted that rickets is a disease *sui generis;* that is to say, that it is a distinct entity, even though it exhibits, like other diseases, multifarious manifestations. On this account, therefore, it is only natural to expect that either it will always be caused by the same etiological factor, or, if many factors are concerned, that they will show a very close connection, to explain their similarity of action. A moment's reflection will show that the second suggestion offers the readiest solution of the difficulty, since by such means only can we hope to combine the numerous influences which have been proved to be concerned in the causation of rickets.

At the present time it is generally recognized that rickets is not simply a disease of the bones, but a general affection, of which the enlarged epiphysial ends, and bending of the shafts, etc., constitute the local, but more or less disseminated, indications.

Though, as stated by Sir William Jenner[24], "we see all degrees of enlargement of the ends of the ribs, and of the other long bones, from that where one might maintain the enlargement was only that proper to the child, to that in which the projections on the anterior wall of the thorax and the enlargement of the wrist would strike the most careless observer," and though, as Rokitansky[25] says, "sometimes it is more prominently marked in one portion of the skeleton, while the rest of the bones are but slightly affected," it may yet probably be safely asserted that a change in the formation of bone constitutes the most constant, the most marked, and the earliest manifestation of the rachitic process. In early cases this change is limited to the growing parts of the bone, and especially affects the ends which show the most active growth.

From what we know of the course and symptomatology of rickets, and of the physiological requirements of a growing tissue, we should expect any abnormality in the latter—excluding congenital, or hereditary, predispositions or alterations—to be dependent on some quantitative or qualitative change in the blood supply. We cannot readily imagine how, by any other means, these various parts of the skeleton could be simultaneously and similarly affected, and in a degree largely proportionate to the activity of the process of growth. On the other hand, we know that for growth an ample supply of nutrition is required, and that any interference with this supply—either in the introduction of an abnormal, irritative element, or in the deprivation of the proper quantity or relative amounts of the normal elements—will of necessity exercise its baneful influence on the process of growth.

It would seem to be superfluous to recapitulate the requirements for obtaining a satisfactory supply of nutrition. Carried out in detail, this would mean a recital of our knowledge of the physiology of digestion, assimilation, and metabolism, with excretion of waste materials; also of the physiology of respiration, and purification of the blood. In addition, we should have to consider the action of the various unhygienic conditions of life which may exert so powerful an influence on the system in general.

But though such a procedure is manifestly unnecessary, I think a brief review of some of the main requirements for healthy nutrition will be of the greatest service in assisting us to come to a conclusion as to the probable pathology of rickets.

It is a frequent simile to compare the body to a complicated engine, the fuel for its continued work being supplied by the food we eat. At the same time, such a comparison does not carry us very far, since in the human body the food is further required to enable constant repair to be undertaken, and during the period of growth to supply the materials from which such growth takes place.

So accustomed are we to accept this view of the process of nutrition, that there is a tendency to forget, or hold of slight moment, other influences which must exert a powerful action in the same direction.

It may be said that the ultimate object of digestion and assimilation is the production of a constitution of the blood in which the various elements composing the food will be brought together and delivered to the tissues in a form and quantity most suitable for use.

But if the soluble constituents of the blood are of such great importance, what is likely to be the influence of the factors concerned in the production and regeneration of the blood elements themselves? In this respect, however, the necessity for an abundant supply of fresh air and of sunlight, and the noxious influence of the factors which may be grouped together as unhygienic surroundings, will be admitted by all, and the very constancy of their action will even prepare us to accept the conclusion of Kassowitz[26], that these factors exert a most powerful influence on the production of rickets. The last-mentioned writer draws attention to the marked prevalence of rickets amongst the children of the poor as compared with those of the better classes, a difference which is one of the most remarkable appearances in the ascertained facts concerning the disease. He shows that it is not explainable by the differences in food supply, and believes that the essential cause is the difference in hygienic environment. Turning now more particularly to the food supply, we recognize that this must contain the following elements, namely, nitrogenous substances, especially various forms of albumin, fats, carbohydrates, salts, and water. In adults requiring food only for energy and repair, we know that a very great latitude in the relative amounts of these elements is permissible, compatible with health. It may be that in them the alimentary tract possesses considerable selective capacity, excreting without injury to the individual, many substances taken in in excess, or admitting them, after digestion, to store them away in the form of fat; or, again, to excrete them, with the consequent damage to the excretory organs, after a prolonged continuance.

In infants, however, the digestive powers are limited at first very materially. Casein and lact-albumin seem to be the only nitrogenous bodies suitable for digestion and absorption, and the relative proportions of these must not, apparently, exceed certain limits. Moreover, the ingestion of unsuitable forms of albumin, of insoluble carbohydrates (starches), of an excess of fats, may each and all be followed by digestive disturbances, which, in addition to the consequent loss of these elements from non-absorption, further drains the system by the vomiting, diarrhea, or other symptoms of gastro-enteritis which result.

How frequently one meets with infants fed on diluted cow's milk, which must of necessity be deficient in fats, or of milk combined with an excess of soluble or insoluble carbohydrates by addition of the various patent foods. Only quite recently I saw an extremely marasmic infant, two months old, which, under medical "direction," had for some weeks past been fed solely on a well-known patent food, largely dissolved in water, the insoluble particles being still in suspension. Can one, then, wonder at the gross ignorance of the requirements for infant feeding exhibited by the laity?

There is, however, no need to dwell on this subject, to which a great amount of attention has been, and is being, given by the various medical journals.

It is, however, desirable to draw attention the fact that, as shown by Rotch, human milk—from poverty, from compliance with the claims of society rather than the infant, or from excitement or worry—may show a deficiency of one element (e.g. fat), or an excess of another (albumin), which not only leads to gastro-enteritis, but to the absence in the blood, in their proper proportion, of the products of assimilation so necessary for healthy growth and development.

Given, then, a series of individuals of various ages, living under similar hygienic conditions, we can readily understand how it is that rickets, which we may more fitly describe as a disease of growth rather than a disease of nutrition (it is evident that the bony changes can only occur so long as growth is taking place), should be pre-eminently met with at a time when the powers of digestion and assimilation are limited. After this stormy period, owing to increased power conferred by nature, the majority of individuals are able to obtain from the food ingested a sufficient supply of the various elements to permit of the process of growth taking place in a more natural manner. If, however, during these later periods, the hygienic environment be bad; if the child suffers from some acute or chronic ailment which greatly diminishes its potential powers for recuperation, or interferes with its subsequent nutrition; or further, if, as in my own case, the child shows idiosyncrasies which can hardly be compatible with normal nutrition—we need hardly be surprised in such cases at the occasional supervention of a condition which is more usually limited in its appearance to the earlier years of life. It is unfortunate that, in almost all the cases as yet reported, the positive and negative evidence upon the points I have mentioned is insufficiently dealt with to allow one to estimate approximately the part played by each.

It appears to me, therefore, that the various recognized etiological factors in the production of rickets may be grouped under one head as regards their effect on the blood. We may say that every factor interfering with the presence in the blood of the elements of nutrition in their proper proportion; all unhygienic conditions which diminish the oxygenation and regeneration of the blood, or prevent the formed elements from adequately performing their functions; and, finally, any hereditary or acquired disease capable of adversely influencing the powers of the tissues in general for growth and repair—may act as factors in the production of rickets. We shall thus be in a position to add a further reason for such a well-established but apparently inexplicable fact as the rarity of this disease in warm climates. I am aware that Kassowitz accounts for this last occurrence by the greater amount of time spent in the open air in warm climates; and it may be that this is the most important factor, as witnessed by the curative effects of a stay in the country in children already affected by the disease. Still it is possible that the severer climatic conditions in colder countries may constitute a greater drain on the infant's potential power, and add their quota to the already heavy burden, which finally culminates in the manifestation of rickets.

But even though a primâ facie case for the above view may be surmised, from the assistance which it renders in explaining the action of the multifarious factors which have been proved to be concerned in the production of rickets, it may be argued that it lacks direct proof. Many writers believe that the essential agent is of a toxic nature. Thus Kassowitz expresses the opinion that unhygienic conditions act by absorption into the system of noxious gases, and others invoke the action of lactic acid, or toxins absorbed from the alimentary canal.

It appears to me that, in the first place, it would be remarkable if different toxins, as the result of their specific action, could produce identical results. On the other hand, as with the virus of syphilis, we must admit their ability to interfere with the normal powers for growth, reproduction, and performance of function of the different active cells. It is, however, impossible to include all the factors under the positive influence of a toxin, and we must in some cases fall back on the negative influence of an absence of normal conditions.

What evidence have we in support of this view? Rindfleisch[27], after describing the morbid anatomy and histology of the changes of the bones in rickets, says "that it seems far from unlikely, and quite in agreement with the general laws of nutrition and vascularization, that the whole of this antecedent development of medullary spaces is really an effort at vascularization, intended to supply both the proliferated and the non-proliferated portion of the cartilage with nutriment." Sir William Jenner also, in the article I have quoted, states that "whatever ailments interfere with nutrition, and so with the formation of good blood," and "whatever external conditions are favorable to the formation of hydremic blood in a child seem to be favorable to the development of rickets."

The most detailed account, however, of the information which we possess on the subject of rickets is given by Kassowitz in his admirable work on normal ossification. This writer expresses the opinion that in the physiological state,—which comprises, of course an adequate supply of what may be termed normal blood, as well as healthy cells,—there is a regular destruction and regeneration "of greater or smaller particles of living substance" (p. 94), the regeneration being in excess of the destruction. In the pathological state, however, destruction is in excess of regeneration; and when the irritation "does not lead to complete death of the whole or part of the organism, necessarily, from that combination of circumstances, there follows what we describe under the name of inflammation." According to Kassowitz, then, the essential character of the rachitic process is an inflammation, the pathological irritation only differing from the physiological in the intensity of its action (p. 95). Under these conditions we should expect that not only "unhealthy cells," or irritative substances in the blood (toxins), with normal cells, but also an abnormal constitution of the blood, continued over a longer or shorter period of time, according to the degree of variation from the normal, or importance of the defaulting substance, would sooner or later give rise to evidences of "pathological irritation." The changes in rachitic bone have been carefully described by numerous writers. Rindfleisch pointed out that the swellings at the ends of the long bones are formed by what he terms an "intermediate substances" derived from the cartilage. Kassowitz showed that the chief part of this enlargement is occupied by the zone of growing cells; "the layer of cartilage, in which the cells are arranged in linear series, instead of being half a line, is from a quarter to half an inch in breadth" (Jenner). In addition, the calcification of the cartilage cells and matrix, the formation and distribution of fresh marrow spaces, the absorption of old bone and the deposition of new, instead of following an orderly and regular sequence, take place very irregularly. According to Kassowitz, all these occurrences are dependent on previous changes in the vascular system, of the nature of an abnormal fulness of the blood vessels, with increased formation of new vessels. It is these vascular changes which constitute the evidence that rickets is a chronic inflammatory process.

Kassowitz* brings forward evidence showing that simple hyperemia, or increased supply of nutriment, leads to an increased growth of the cartilage, with an increased absorption of old bone, accompanied by an increased deposition of new bone, i.e., to excessive growth. With rickets, however, the increased deposition of new bone is replaced by a delayed ossification, a condition which only occurs when there is increased formation of new vessels. It is thus evident that a further factor than hyperemia is necessary for the institution of the inflammatory process, and the question arises, can a defective nutrition supply this factor?

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* Bd. ii. Abth. 2, S. 19.

Kassowitz* has shown that the direct action of a toxic agent, such as particles of phosphorus, in the circulating blood can produce changes in the ossifying tissues in growing animals analogous to those which are found in histological pictures of bones affected by rickets. But, more important still, he has demonstrated a similar effect as the result of inanition.

By keeping very young animals for some days without any food, he observed changes in the growing ends of bones "which in many respects have a great similarity to the pictures of rickets and the effects of larger doses of phosphorus." The changes consisted of an enormous dilatation, with an increase in number of the blood vessels, accompanied by an accelerated absorption of bone and cartilage.

In a similar manner, by the artificial withdrawal of blood from a limb in a growing animal, he showed that a local inanition is capable of inducing an inflammatory state in the growing parts of the bones of that extremity.

In these circumstances there can be no question of the direct action of a toxin. The requisite factor can evidently be supplied by the negative phase of absence or deficiency of nutritive supply; and it is only reasonable to conclude that if the supply of nutrition as a whole can exert this effect, then the continued deficiency of any of its parts (fats or albumins from digestion, inefficient oxidation, etc.) will exert a similar influence. It seems to me that the position is admirably summarized by Kassowitz.** According to him, a general withdrawal of nutrition, as well as the cutting off of the nutritive supply to a portion of the growing organism, can in a short time give rise to a well-marked inflammatory state at the growing parts of the bone. From these two important facts, then, the causal

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*P. 97. **P. 98.

connection between a large group of injurious conditions capable of producing rickets, and the anatomically demonstrable inflammatory changes at the growing portions of the bones is made perfectly clear. Thus a quantitative or qualitative defect in nutrition, continued over a long time, will be able ultimately to produce the same, or a similar, effect that a general or local withdrawal of nutrition can bring forth in a few days. The continued giving of the wrong kind of food, as also every faulty chemical process of digestion and metabolism, will show itself during the time of active growth in an abnormal condition of the newly formed tissues, and will manifest itself in the whole body by an appearance of illness, by insufficient increase in weight, and by a greater vulnerability of the affected individual, and of his individual tissues and organs. At those ends of the bones, however, in which a very energetic growth is taking place, and where, therefore, a faultily built and consequently less resistant tissue is produced in greater extent, this vulnerability of the young tissue, and especially of the loose and unstable structure of the walls of the young blood vessels, will very readily lead to those inflammatory antecedents and their consequents which we define as rickets."

The bearing of this view of the etiology of rickets upon the therapeutic measures to be adopted is too evident to require detailed consideration.

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DUKES' DISEASE*

By Benj. Edson, M.D.

In the London *Lancet* of July 14, 1900, Dr. Clement Dukes reports an epidemic of a contagious eruptive disease occurring in a school at Rugby—a disease which was declared to be neither measles, scarlatina, nor yet rubella, but which in its entirety presented some of the features of each of these three diseases. In the absence of any recognized name for this newly discovered disease, he called it tentatively the *Fourth* Disease.

His studies of that particular epidemic were confined to nineteen cases, although for some years he had observed similar epidemics leading towards the conclusions formed in this. His method of proving this to be a distinct, if not a new disease, was essentially clinical. Briefly summarized, it may be said that children that had already had measles, scarlatina and rubella, were not thereby rendered immune to this Fourth Disease, and still further, that some of those that had this so-called Fourth Disease subsequently contracted measles, scarlatina, and rubella, when exposed to them. Accepting Cullen's law that "one attack of an eruptive fever entails immunity from a second attack during childhood"—to which, as we all know, there are not infrequent exceptions, but which is in the main true—Dukes would account for those observed cases in which children are said to have had measles even three or four times, by assuming that one of these attacks was doubtless this Fourth Disease.

Broadbent and some others in England endorse the claim of Dukes, while others equally eminent hesitate, or decline to accept it.

Bokay (Deutsche Medizinische Wochenschrift, October 20, 1904) believes the disease to be a separate entity, and points out that Filatow in 1885 describes something of the kind and terms it rubeola scarlatinosa. Bokay proposes the hyphenated name Filatow-Dukes Disease.

In April, 1904, in the cases to which I shall refer hereafter, Dr. Winfield and myself used informally the equally descriptive term Dukes' Disease, and that name I shall use in this paper.

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*Read at a meeting of the Pediatric Section of the Kings County Medical Society, Dec. 28, 1904.

In this country but little attention has been given to Dukes' claims of having differentiated a distinct eruptive disease, and his views are received with some skepticism. A few writers have incidentally referred to Dukes' writings on the subject, but at best only with qualified acceptance.

French says: "There is much doubt about the propriety of admitting the (Fourth) disease as an entity, and not merely as a form of rubella."

In the International Annual for 1904 the subject is mentioned with a like reservation.

Curtis and Shaw, of Albany, in the *Medical News* of December 20, 1902, report 147 cases of an exanthematous epidemic at Round Lake—66 children and 81 adults. Nowhere else do I find recorded so great a preponderance of adults, either in rubella or in Dukes' Disease.

As a general rule these mild exanthems are confined almost exclusively to children.

And here a word in regard to the progressive differentiation of the exanthemata may not be out of place. In the days of Sydenham, all the eruptive fevers were classed under the general term variola. He observed a class of cases having certain distinctive characteristics and gave them a separate classification, as morbilli, or measles. Up to near the close of the 17th century, measles and scarlatina were considered as one and the same disease—measles. It seems incomprehensible to us that these two diseases, so unlike as we see them, could so long have been grouped together.

William Moss, in his essay on the management and nursing of children (London, 1781), gives extended consideration to small pox, chicken pox and measles, but does not even mention scarlatina.

Another writer, near the close of the century, treats of measles at length, but devotes less than a single page of his book to that form of measles called the scarlet fever.

About the middle of the last century, rubella became detached, as it were, from its associated congeners as a disease by itself. The question is now raised as to whether rubella includes two or more distinct and recognized diseases.

Rubella is generally considered to be a multiform disease, varying widely as regards period of incubation, appearance of the eruption, general symptoms and complications. I here use the term rubella as synonymouus with and embracing German measles, French measles, rötheln, rubeola, notha, rubeola sine catarrho, and epidemic roseola, but not including symptomic roseola. Whether all these terms truly stand for one and the same disease, or for two or more distinct diseases, fairly admits of discussion.

In April and May, 1904, there occurred in the Home for Destitute Children, in Sterling Place, in this city, 64 cases of a contagious eruptive disease of an unusual character, and these cases constitute the text of this paper.

The first child attacked was an Assyrian boy about nine years old. He had been in the institution for several months, and the only communication with or from the outside world was through a visit from his sister, a young girl, who visited him just two weeks before. Although I do not know that this girl was ill, or that she brought the disease into the Home, I think the circumstantial evidence sufficient to warrant this assumption. This would make the period of incubation about fourteen days, which, so far as we could determine, was the average time of all the cases.

The first thing that called attention to the boy was the eruption on the face, particularly around the mouth. It soon extended to the cheeks, forehead, neck and downwards over the body and limbs. The time to the full development was about one day. It soon began to disappear in the order of its onset, and at the end of two or three days it entirely disappeared. In some few cases slight macules remained for two or three days longer.

The eruption was distinctly papular, small elevations close together, pale in color, with no tendency to bat's-wing grouping, except that in perhaps 25 per cent. of the cases the eruption over the loins and upper portion of the buttocks was manifestly crescentic, as in true measles.

Not one of the children was really ill. In only a few was there any elevation of temperature, none above 100 degrees Farenheit. There was no increase in pulse or respiration, no coryza or bronchitis, no loss of appetite or sleep. There was no pruritis, and in only one case was there noticeable desquamation. No enlargement of the glands, no complications, and no sequelae.

To this broad statement there were perhaps a dozen exceptions—cases in which there was efflorescence in the fauces and adjacent structures, and Koplik's spots were present as in measles. This last notable feature rests not on my observation alone, but can be verified by Dr. J. M. Winfield, who saw a number of the cases.

So far as I am aware, no mention has ever been made of Koplik's spots either in rubella or Dukes' Disease.

Indeed, Holt says, "Koplik's spots form a valuable means of distinguishing measles from rubella." The obvious inference, therefore, is that Koplik's spots are not found in rubella.

Corbett says that in rubella there is no tendency to form crescents. In these cases, at the height of the eruption, the crescentic form was very evident on the loins and buttocks.

The history of this first case represents the general type of all these cases, with one notable exception. That exception was a boy four years old, in which the eruption was a bright scarlet, covering uniformly almost the entire surface of the body and limbs, and looked like a typical case of scarlet fever. There was absence of fever, however, and all of the usual symptoms of scarlatina, except the eruption alone. So marked was the appearance that it was deemed prudent to isolate the child until in a day or two the rash began to disappear, and the disease followed the general course of the other cases. This case demonstrated conclusively that, notwithstanding the wide difference in the form of the eruption, the disease was one and the same. This was the only child of the 64 that was kept in bed for even one day, and the only one in which desquamation was positive.

The ages of these children were from four to thirteen years; only one adult, a woman of thirty-two, contracted the disease, although others were fully exposed to it.

Of rubella, Anders says, "Sore throat is nearly always present, with enlarged tonsils, dry cough and bronchitis. In severe cases, the post-cervical, axiliary and inguinal glands are involved."

Corbett says, "Tonsils swollen, with hoarseness and cough, in 96 per cent. of all cases."

These symptoms, with fever, appear to have been present in the cases reported by Curtis and Shaw under the name of rubella scarlatiniforme, and these seem to correspond in the main with those on which Dukes bases his classification of an independent disease.

The difference in the period of incubation is one of the basic points on which Dukes lays much stress in his differential diagnosis. Unless this is established beyond peradventure in a large number of carefully observed cases, it does not seem sufficient to warrant a new classification. It is a well recognized fact that in all the exanthemata. whatever may be the average, the incubation period varies widely in the extremes, as well as in different epidemics.

In these cases that I report, the symptoms and course of the disease do not correspond with the generally accepted features of rubella, nor yet with those described by Dukes. If for want of a better name they must be classed under the head of rubella, with the one given exception they belong to the morbilliforme type.

I have studied with some care Dukes' differential diagnosis between rubella and the Fourth Disease, in which he sets down in parallel columns the characteristic features of each, and I am forced to the conclusion that they are so almost exactly alike that one heading would answer for both, and the columns or headings might change places without making any material difference.

The importance of a correct diagnosis lies not in the gravity of the milder forms, but in the liability of mistaking them for the diseases that are truly serious. It is often impossible to diagnose correctly eruptive disorders at a first visit. This the health authorities expect us to do, but when a day or two later our diagnosis is found to be erroneous, some of us know by experience that it is not easy to convince the authorities that our report should be amended, and an unnecessary quarantine raised. Still more serious is it when a patient with a trifling eruption is removed to the hospital for contagious diseases, when, or on the way in the ambulance used indiscriminately for all kinds of contagious diseases, except perhaps small pox, the unwitting victim stands a good chance of picking up the real thing.

In view of all these facts, and in the light of your individual experience, is there a Fourth or Dukes' Disease?

This is the question that I submit for your consideration.

SOCIETY PROCEEDINGS

NEW YORK ACADEMY OF MEDICINE.

Section on Pediatrics.

February 9, 1905.

Dr. Le Fetra in the Chair.

Enlarged Spleen.—This case, that of a negro girl, first seen in the winter of 1904, at the age of ten years, was presented by Dr. E. Long, Jr. She was the fourth child, the others showing evidence of rachitis, but healthy in other respects. The patient had had measles and malaria. Since an attack of pneumonia, eight years ago, she has been subject to nose bleed. When first under observation she was complaining of pain in her stomach, and the spleen was found enlarged, hard, and almost nodular. At that time the provisional diagnosis was pseudoleucemia infantum. It was the blood examination which lent interest to this case. Dr. Goldhorn reported the count as made a year ago and at the present time as follows:

	1904	1905
red cells	2,500,000	3,100,000
white	18,400	16,000
hemolobin	42%	43%

In 1904 there were a great many myelocytes and a good many eosinophiles, whereas almost none were found in 1905. A remarkable poikilocytosis was seen in the red cells in the earlier examination and was still marked, an unusual elongated corpuscle shaped like a sausage being the characteristic element. No megaloblasts nor malarial parasites were found. Macrocytes, all showing central pallor, were abundant, unusually so for a secondary anemia, the same was true of pessary forms. An increase of cogoulability was discovered.

Dr. Heiman thought it likely to be a case of splenic-myelogenous leucemia, but Dr. Goldhorn believed this to be excluded, as the myelocytes were not more than 4 per cent. and the mast cells almost wholly lacking.

Syphilitic Pseudoparalysis.—Dr. Jacob Sobel presented a paper on this subject, which will be found in full on page 401 of this number of Pediatrics.

Visceral Syphilis in a Child with Heredo-Syphilis Tarda.—This patient, a boy aged nine years, was presented by Dr. Welt-Kakels. The family history gave evidence of syphilis contracted by the father two years before the birth of this child, the fifth in the family, the others being healthy. He was very small at birth, which occurred somewhat before full term, and lost considerable blood through the slipping of the cord ligature. Snuffles appeared early. At six months the bones around the right elbow joint swelled. He had one umbilical and two inguinal hernias. At one year the right shoulder was dislocated. At two years, measles complicated with croup and pneumonia occurred. At three paronychia on the right great toe. At six years, interstitial keratitis set in in both eyes. At seven he had enlarged lymph nodes. Last summer he had bronchitis. Several weeks ago he began to suffer from abdominal pain, constipation, anorexia and a tendency to tire easily. He was undersized, badly nourished, pale and sallow, with notched median incisors. The cervical, inguinal and epitrochlear glands are slightly enlarged. The abdomen is considerably enlarged with markedly dilated veins. The liver was large and rather hard, not sensitive. Dulness of five and a half inches over the left lobe. The spleen was markedly enlarged, hard and not sensitive, its dulness joining that of the liver. The blood count showed red cells, 4,480,000, white cells, 11,000, hemoglobin, 30 per cent. Urine normal.

CASEINE DIGESTION IN RELATION TO INFANT FEEDING.—Dr. T. S. Southworth presented this subject in a paper which opened with the recognition of the empirical character of methods of infant feeding hitherto, and the different proportion of proteids, fat and sugar, in the various mammalian milks. The proteid consists of soluble albuminous bodies and of caseine, which probably differs in the different milks, as the caseine of one species is not digested with equal ease by another. Some of the investigations made at the New York Agricultural Experiment Station in the process of cheese making have yielded valuable results bearing on the question of infant feeding. It has been found that the calcium casein of cow's milk is changed by the rennet of the stomach into calcium paracasein forming a soft clot, indigestible in the stomach, which is passed on into the intestine. A little acid removes the calcium and leaves free paracasein and the addition of more acid combines with the free paracasein, in the case of the the hydrochloric acid of the stomach forming hydrochlorid of paracasein, which is a tougher curd than calcium paracasein, as is also free paracasein. In addition to the fact that cow's milk forms curds in the infant's stomach, less easily digested than those of breast milk, it is also true that the lactic acid may increase the quantity and indigestibility of the curd formed with rennet and acid in the stomach until the pepsin present cannot digest it. But if the milk was sour enough to curdle before being taken the acid has already acted and formed curds of lactate of casein and free casein, which are softer than those of paracasein and are not changed by the rennet. Consequently buttermilk and fully soured milk are more digestible. There is obviously great danger in allowing an infant's milk to remain in conditions favoring the production of lactic acid short of actual curdling. These facts explain the influence of lime water, bicarbonate of soda, etc., preventing the early clotting of the milk in the stomach, and allowing part of it in its fluid state to pass to the intestine and be there digested. Peptinized milk, also, has a portion of the caseine changed into forms incapable of coagulation. The fact that, especially with older infants, the digestion is improved by introducing a stronger diet, is accounted for by the fact that this provides more casein for the acid to work upon, thus forming free paracasein instead of hydrochlorid of paracasein which is a tougher curd than the former. The passing of tough curds in the stools indicates a superabundance of acid, either the hydrochlorid acid of the stomach or lactic acid in the milk, or some other formed in the stomach during delayed digestion. The author believes that the chemistry and physiology of digestion will furnish ground for valuable future studies.

Dr. Chapin said that he had been working on this question of infant feeding for several years. He thought that the work in the direction of fine percentages had gone about as far as it could. It had seemed to him that the value of percentage feeding consisted chiefly in a knowledge of food values, and he had then taken up the study of the biological properties of milk. He commended the work of the Department of Agriculture and said we should know more about the proteid of milk, where best digested and how best prepared for digestion. He was inclined to think that its function was not wholly nutritive but developmental as well. There were limitations to the chemical manipuation of cow's milk and one must not expect to make it just like breast milk.

Dr. W. L. Carr said that it was an accepted fact that cow's milk was the best for artificial infant feeding when that became necessary, because it was easily obtained and adapted, but it must not be supposed that even when the chemical formula was made to approximate that of breast milk the assimilability was equally approximated. Astonishingly slight changes in the chemistry of breast milk occasioned disturbances in digestion, and in the use of modified cow's milk it was difficult to obtain such fine percentages. The nutritional condition of each individual patient should be considered, and the food carefully adapted to its needs.

Dr. F. M. Crandall said that the artificial feeding of infants was so difficult that any light on the subject was most welcome. The paper read had explained some of the unsatisfactory results of empirical procedure in this matter. He thought that general practitioners were apt to feed too large percentages of proteids and specialists erred in the opposite direction. Sometimes when a child on diluted casein passes tough curds it is due to too rapid taking of the milk and may be corrected by substituting a nipple with a smaller orifice.

Dr. C. G. Kerley thought that the discussion of the chemistry and physiology of infants' digestion and the preparation of milk did not cover the whole question of the digestion of proteids, and that more attention should be paid to the condition of the child. He had found a daily washing of the stomach most helpful in cases of malnutrition in infants. Abundance of fresh air, salt baths, massage and inunctions of oil were also valuable.

Dr. Godfrey R. Pisek said that the continued use of alkalies would neutralize the acid in the stomach, and if the milk was wholesome this would not be necessary. The addition of the alkali did not break up the curd, but merely secured its expulsion into the intestine before the requirements of the stomach were fulfilled.

Dr. E. F. Brush thought that a good deal of work on infant feeding was being done along wrong lines. He had no confidence in the work of the Agricultural Department and thought that the Board of Health should develop further its work of dairy inspection.

Dr. E. H. Bartley said that the removal of the calcium salts from the milk would allow the milk to pass through the stomach without coagulating if there were no calcium salts in the stomach. This was the problem he was now trying to solve.

Dr. Southworth said that what he wished chiefly to emphasize was the physical changes which the milk underwent in the process of digestion. He agreed with Dr. Kerley that it was necessary to improve the child's physical condition as much as possible in order to secure successful digestion. The washing out of the stomach removed decomposing matter and bacteria and acids, which had a tendency to form the tough curds. He thought that Dr. Crandall had succeeded by beginning with the weaker food and when the child's digestion had been brought into good condition replacing it with the stronger.

CHICAGO PEDIATRIC SOCIETY.

February 21, 1905.

President Dr. Samuel J. Walker in the Chair.

Mongolian Idiocy.—Dr. Julia D. Merrill presented a case of Mongolian idiocy. She said: This case is interesting because of its points of resemblance, as well as of differences to the last patient shown by Dr. West. This child, Ethel C., is also nine years old. She is five inches in height below the average for her age, while the weight is six pounds in excess. In both girls there are shortened stature, disproportionatally shortened extremities, open mouth, big tongue, guttural voice and deficient mentality. The differences will suggest themselves in the physical examination. My patient is the youngest of nine children, the others all being normal. Both parents are living, the mother at 52 years and the father 51 years of age. They are not related. There is no history of syphilitic or tuberculous taint in the family. The mother states she was not well during gestation, but doesn't give symptoms clearly enough to form an idea of the nature of the illness. Labor was normal, at full term. The patient was small at birth, but with the exception of size, no peculiarity was noticed by the family until the later part of the first year, when they realized she was making no progress in growth. Eruption of teeth did not occur and she made no effort to walk or talk until she had passed her second birthday. For a few months then there seemed to be a spurt of development, although at no time did she approach the normal standard. Formerly small and poorly nourished, she now put on flesh rapidly. When five years old she had measles, followed by pertussis. Neither infection was severe and she convalesced as rapidly as the other children. She had no illness excepting an occasional tonsilitis. She not only eats ravenously at the regular meals, but unless watched, will eat frequently in the intervals. She snores during sleep and has the habit of tongue sucking.

Physical Examination.—In the physical examination you note that adipose tissue is abundant and uniformly distributed. There are no supra clavicular pads. The skin is ruddy in color, warm, moist and of good texture. The hair is fine, not harsh and of average thickness. She has a round head, the antero-posterior diameter, being but a trifle longer than the parietal. There are no prominences and especially is this true of the occiput. The back of the head forms nearly a straight line continuous with the trunk. She can claim the term of "full moon" face. The forehead is low. The eyes seem widely separated, with epicanthic folds and upward tilt of the outer angles. The nose is small and flat at the root. She is a mouth-breather. Although the post-nasal space has been cleaned out and a bony exostosis removed, the habit of keeping the mouth open has not yet been overcome. The tongue has a characteristic appearance, said to be present in no other class of imbeciles, namely, the many deep fissures.

The chest is negative. There is a slight scoliosis and considerable lordosis. The abdomen is protuberant, but otherwise negative. The extremities are short, but not so markedly short as in the achondroplasiac. The fingers are tapering and there is incurving of the little fingers—whatever value that may have. The ligaments are all lax, allowing great flexibility of the joints. She tires easily, drops into a chair after standing a few minutes, and in many ways shows lack of the ceaseless activity of the normal child.

She is always good natured, imitates closely and obeys for the moment, but memory is poor. Her mental development is hardly that of a normal child of three or four years. She has a ready reply for every remark made to her. We may not be able to see any relevancy between her answer and the question, but it comes back quickly and seems satisfactory to her.

It was in 1886 that Dr. Langdon Down classified imbeciles according to racial types, as Caucausian, Negroid, Mongolian, etc. The Mongolian, or Kalmuc, is the only one that is recognized to-day as constituting a special type. These cases have been reported in Great Britain much more frequently than in any other country. Muir, who reported 26 cases, says that up to February, 1902, he was able to find in the literature of other countries but two German and Austrian and five American references. In Great Britain, Mongolian imbeciles are said to form from five to ten per cent. of all the mentally deficient. Muir estimates the proportion in Scotland as three per cent., and the type at least four times as common in cretinism. In a group of deficients, Kassowitz reports 22 cases of cretinism, 75 of Mongolism and seven of micromelia.

The etiology was believed by Langdon Down to be tuberculosis. Sutherland found a positive history of syphilis in eleven of his 25 cases. He considered it not an active manifestation of hereditary syphilis, but that the arrest of development is due to a "parasyphilitic condition." He acknowledged anti-specific treatment did not benefit. Advanced age of parents, bad health of the mother, consanguinity and alcoholism are causes suggested by others. None is present sufficiently constant to be considered of much etiological importance.

From the post-mortems it may be accepted that the condition is not due to the absence of any internal secretion. The thymus, thyroid and suprarenals are normal in structure. There are no evidences of imperfect ossification as in achondroplasia. There is an early union of the bones at the base of the skull, but this is probably secondary to the lack of development of the structures in that region. This defective growth has been noted in all the autopsies. In his report of the examination of the brains of five Mongols, Dr. A. W. Wilmarth says the small size of the cerebellum, pons and medulla was the most marked departure from the normal. Their weight in all the cases was only one-fourth of the average for age. Defective development is also seen in the imperfect hearts found in a considerable proportion of the patients, in the shortness of the extremities, the laxity of the ligaments, as well as in the retarded mental development.

Mongolian imbeciles show little resistance to disease and the prospect of long life is poor. To a limited extent they are teachable, but one cannot hope for improvement from the use of thyroid extract. This remedy may lessen the obesity, but has proved of no benefit in any other way.

Presentation of a Case of Cretinism.—Dr. J. C. West presented a patient who came under his observation about two months ago. The child is nine years of age, and is the fifth of six children. All the other children are well; the father and mother are both living and well. This child presented nothing abnormal, at least to the parents, until it was sixteen months of age, when the neighbors remarked to the mother that the child was somewhat backward. The mother then began to notice this. The child did not walk or talk. She nursed the child twenty months; then, when the child was about two years of age, it was taken to the Hahnemann Hospital for treatment. It was treated in that institution for nearly two years, with no apparent beneficial result. During that time an operation was performed under the jaw. You will notice a V-shaped scar under the chin following the rami. The object of the operation is not known; but the parents described it to me as though 'something had been cut and tied." Whether the surgeon tried to ligate the arteries and produce atrophy of the tongue, I do not know; but he operated for "protrusion of the tongue," so far as I can learn. After nearly two years' treatment in Hahnemann Hospital, the mother became dissatisfied and quit going there. Since that time the child has been observed by a number of physicians in the locality in which it lives, but none seemed to have recognized the true nature of the disease. The mother had been told that the child was an idiot, and that there was no hope for it. Perhaps the point of greatest interest is that the disease was not recognized by any of the several physicians who had seen it when it was a perfectly typical case. The patient came under my notice on the 20th of December, when the conditions were the same as you see now, except that they were much aggravated. Under specific treatment they have gone down. At that time the child weighed about ten pounds more than it does now. At present it weighs in the neighborhood of thirty pounds. It is about thirty and a half inches in height. It is difficult to measure the child accurately on account of its restlessness and its inability to stand The child has the appearance of low mentality; a broad nose, thick lips, protrusion of the tongue, large head, and lack of intelligence in the eyes. The skin at the time it came under observation was rough, and had the characteristic doughy feel of the cretin. The so-called fatty pads were present; and the reduction in weight is due probably to the disappearance of those fatty pads. The abdomen was pendulous, large, and at present it shows very plainly diastasis of the recti, with a tendency to umbilical hernia. The hair is thin, dry and coarse. The fontanelle is closed. The occipital protuberance is very well marked The hands are characteristic, although they are losing some of their characteristic points. They have a spade-like appearance, with stubby, short fingers. All of the long bones are relatively short and thick. The neck of the child is thick and short; and if there is any thyroid gland present, it is hard to make it out.

The child, when it was first seen, was placed on specific treatment. It was given a little too much of the thyroid extract. I considered the dose for a nine-year-old child, without thinking of the small stature, and for that reason a too large dose was administered, which induced marked nervous symptoms, with elevation of temperature. The rectal temperature, when the child was first observed, was 96½ degrees F. Restlessness and increased temperature were manifest in a day or two after the beginning of the treatment. The child got up to about one grain of thyroid extract at a dose. This was reduced until finally it was taking one-half grain of the thyroid extract three times a day, after which it showed very little tendency to restlessness. The mother of the child informs me that the thyroid extract was reduced to one-quarter of a grain for a little while, after which the dose was increased again. The skin was dry and rough, but now assumes more the characteristic of the skin of a healthy child. It is soft now and has lost that markedly dark color it had at the beginning. In general, the child is improving. Its voice, which you hear, is not nearly so hoarse as it was when treatment was first instituted, although at times it has been better than it is at present. The child cries more lustily than it did. It had difficulty in swallowing, but after about four weeks' treatment the appetite improved markedly until now it seems to be hungry all the time, and there is no difficulty apparently in swallowing. The tongue protrudes at present; but the mother tells me that most of the time the child keeps the tongue in the mouth. The lips are not so thick as they were. The child shows more intelligence than it did. On the whole, it has improved markedly under thyroid extract in two months.

So far as the prognosis is concerned, we do not know just exactly how much more the child will improve, but it has reacted so well under this treatment that we can hope for considerably more improvement. It has already begun to say such words as mamma and papa, which I think speaks well for a good result.

Typhoid Fever in a Child of Fourteen Months, with Pathological Findings.—Drs. Alfred C. Cotton and William J. Butler reported jointly this case. Dr. Butler, in reporting the case, said: This child was fourteen months old and was admitted to the Presbyterian Hospital on the 5th of January.

As to the family history, the parents are both living and well. This was the only child. It had always nursed; had never been sick and was considered healthy. The child's illness began on a Thursday afternoon, at which time the mother, on returning from a visit to a neighbor's house, found the child crying. It refused to nurse. That night it vomited frequently, was restless, and slept very little. The condition remained about the same Friday and Saturday, save for a higher temperature and greater restlessness. The child continued to vomit spontaneously after nourishment or water. The vomitus was said to have a foul odor and to be of a brownish color. Did not cough. Had a constipated stool on Thursday; since that tiime stools were liquid, brownish in color, and of a very foul odor. There were three or four movements in the twenty-four hours. Patient entered hospital Saturday at 7 P.M. Examination gave the following:

Child appeared to be well-nourished. It was restless; rolled its head from side to side, but made no noise. The hands and feet were cold. The eyes rolled upwards, but were negative. The neck and chest were negative, except for some fine moist and crepitant râles, heard posteriorly and below, suggestive of edema of lungs. The abdomen was slightly distended, but soft. The spleen and liver were not palpable. Lower extremities presented slight edema. After entrance the child had a temperature between 105.2 degrees and 106 degrees, until death, which occurred the following morning about two o'clock. Respiration was between 50 and 60 per minute. The bowels moved three or four times during the time the child was in the hospital. The pulse was very rapid and feeble.

The following is a report of the post-mortem examination, made by Dr. Bassoe, pathologist to Presbyterian Hospital:

Report of Pathologist.—F. M., aged fourteen months. Clinical diagnosis, open. Attending physician, Dr. Cotton. Anatomical diagnosis, typhoid ileocolitis. Acute mesenteric lymphadenitis; acute splenitis, slight. Acute degeneration of liver and kidneys. Slight edema of the lungs and subcutaneous tissues. Patent foramen ovale.

The body is that of a well-nourished and well-developed female child. The length of the body is 75 cm. There is considerable edema of the subcutaneous connective tissue, which is most marked in the lower extremities. The peritoneal cavity is empty. The small intestines are distended with gas. The ileum hangs over the brim of the pelvis and is very hyperemic and dark in color. Both pleural cavities are empty and free from adhesions. There is no change in the pericardium; the thymus covers the upper half of the pericardium, and measures 6 cm. from above downward; 5 cm. from side to side, and 8 mm. anteroposteriorly. The thyroid gland is small and its cut surface normal. The larynx and trachea are not changed. The largest cervical lymph glands are 4 mm. long. The tracheal and bronchial glands are of similar size. The left lung crepitates. The cut surface is grayish-pink, and contains a moderate amount of blood and frothy fluid. The right lung resembles the left. The heart weighs 45 grams. The endocardium is everywhere smooth. The cavities of the right side of the heart contain clotted blood. The foramen ovale is patent by a large slit at its margin. The myocardium is of a uniform grayish-red color. The spleen measures 6.5x3.5x1.5 cm. The cut surface is mottled, dark red and gray. The Malpighian bodies are very distinct. The tongue and pharynx are not changed. Each tonsil measures 15x7 mm., and contains a grayish nodule, 2 mm. in diameter. The esophagus is smooth. The stomach is empty, and measures 8 cm. from side to side. The mucous membrane is smooth and thin, with slightly developed rugae. In the upper portion of the small intestine there are no changes. In the upper portion of the ileum Peyer's patches are moderately swollen. This swelling gradually increases from above downwards. Necrosis of the swollen patches appears within 40 cm. of the ileocecal valve; 25 cm. above the ileocecal valve is a greatly swollen patch which is partly necrotic. The mucosa below this patch is everywhere hyperemic; both Peyer's patches and the solitary follicles are swollen and partly necrotic. Just above the valve is a patch 4 cm. in length, from which the necrotic tissue has partly sloughed away. The ileocecal valve itself is swollen and partially ulcerated on its proximal surface. The mucous membrane of the appendix is smooth, but hyperemic, and has a distinct, shaven-beard appearance. The mucous membrane of the ascending colon is also swollen and the solitary follicles are very prominent. Throughout the mucosa scattered dots the size of pin points are seen; these are identical in appearance, but much less numerous than those which give the shaven-beard appearance to the mucosa of the appendix. There are no ulcers present in the large intestine. The mesenteric glands, especially those closest to the ileocecal valve, are enlarged and soft. The largest of these glands are 14 mm. in length, and the cut surface is grayish-red in color. The liver weighs 245 grams. It is smooth externally and rather soft; the cut surface is grayish-red, and the markings are rather indistinct. In places the cut surface has a mottled appearance, on account of the presence of very pale areas. The gall-bladder contains dark bile. Its lining is smooth. The pancreas and adrenals are not altered. The right kidney measures 6x3.5x2.5 cm. The capsule strips off easily, leaving a smooth surface. The cortex is 4 mm. in thickness, and is rather pale. The relation of cortex to medulla is as 1 to 3. The markings are not distinct. The left kidney answers to the same description. In the urinary bladder there is no change. The uterus is 2 cm. long. Each ovary measures 18x7 mm. The spinal meninges and cord show no changes; the cerebro-spinal fluid is clear. The brain could not be examined.

Histological Description.—Sections from the intestine show marked hyperplasia of Peyer's patches, the lymphoid tissue in the submucosa constituting over half of the thickness of the bowel wall. The overlying mucosa is thin, hyperemic, and in places it is absent, leaving the submucosa exposed. In the interior of the lymph follicles considerable hyperemia is present, and proliferation of large cells (endothelial). Many polymorphonuclear leucocytes are seen among the larger cells. The muscular and serous coats are not involved. In the spleen the lymph follicles forming the Malpighian bodies are also prominent, and resemble those of the intestine in appearance, being largely made up of large cells. The pulp is greatly engorged with blood. In the kidneys the epithelium of the convoluted tubules is somewhat swollen and granular. The glomeruli are not altered. Aside from hyperemia, no change can be made out in specimens from the liver prepared in the usual way. The heart muscle, thymus, thyroid and pancreas are not altered.

Bacteriological Examination.—A bacteriological examination was made of the bile and spleen. The culture media remained sterile.

Clinically, this patient was sick about sixty hours, prior to which time the child apparently showed no special disturbance of any kind, so far as the parents noticed. It is not improbable, however, that the child had been ailing for some days, or had presented some symptoms which were unnoticed by the parents. The course it pursued clinically simulated that of a case of gastroenteritis; but the pathological findings were accepted at once as those of typhoid. Many other conditions than typhoid may result in hyperplasia of Peyer's patches, that is, other infections than typhoid. But the hyperplasia, with ulceration, however, is not a common finding in other conditions than typhoid. We have in this case hyperplasia most prominent in the lower part of the ileum, especially in the region of the ileocecal valve. Although the diagnosis in our case will never be accepted as absolutely certain, on account of negative cultures, still the postmortem findings, the hyperplasia, the beginning necrosis, and ulceration of Peyer's patches, together with hyperplasia of the adjacent mesenteric glands, form the typical anatomical picture of typhoid in a child in whom the hyperplasia predominates over all other features. While ulceration is more characteristic of adult life and late child life, hyperplasia of Peyer's patches is most commonly to be found in infants. Rilliet and Barthez, when pointing out the difference between typhoid in children and in adults, called attention to that fact. They spoke of typhoid in infants and in younger children as being characterized chiefly by hyperplasia of Peyer's patches, which in the majority of instances in young children, instead of proceeding to ulceration, terminated in resolution, and drew attention to this as one of the striking differences between typhoid in the infant and typhoid in the adult. While we do not wish to be placed on record as making a diagnosis positively of typhoid in this case, we cannot see what other diagnosis could be made anatomically. On the other hand, it is not improbable that there were bacilli in the bile and spleen, but that they were few in number and escaped detection.

Dr. Butler called attention to a point that seems to be a symptom of gravity in typhoid in children, and that is vomiting at the onset, which continues into the course of the disease. He has the record of another case, six or seven years old, in whom among the first prominent symptoms at the onset was vomiting, which persisted throughout the course of the disease. The child died on the seventh day, with a temperature of 106 degrees, and a pulse of 170 just before death.

PHILADELPHIA PEDIATRIC SOCIETY.

January 10, 1905.

The President, Dr. J. H. Jopson, in the Chair.

Intesinal Atony in Infant.—An infant, two years old, was shown by Dr. D. J. M. Miller. The child had been well at birth, and as far as was known until it was weaned, at the age of ten months. It was fed after weaning on condensed milk and various infants' foods. Four months later it was placed at a baby farm, and when its mother took it back again, after an interval of several months, she noticed at once that it did not seem as bright as it should, and that the abdomen was distended. The child had been to several hospitals at different times since then, and came under Dr. Miller's care at the Children's Hospital. There was a history given of persistent diarrhea and of improper feeding. The child was rickety, with emaciated limbs, and the abdomen distended to a circumference of 23 inches. The stomach when filled with water could not be outlined, and the colon could retain a quart of fluid for some twenty minutes. Palpation failed to detect the liver or spleen or any enlarged glands or masses. Large quantities of intestinal gas were constantly being passed. The superficial veins could easily be traced over the abdomen, but their junction with the thoracic veins could not be made out. The temperature ranged between 99 and 101 degrees Farenheit. Secondary anemia was present. A few hyaline and granular casts were occasionally detected in the urine, with a trace of albumin. The possibility of intestinal or mesenteric tuberculosis was recognized, and two injections of tuberculin made; reaction followed promptly in both cases, but, nevertheless, this was not thought sufficient evidence upon which to base a diagnosis, since the reaction might be due to a focus of tuberculosis elsewhere. The presence of bronchial and intestinal catarrh of long standing made it not improbable that this focus might exist in the bronchial lymph nodes or the mesenteric glands, although it had not been detected there. The patient had improved in weight and general condition under careful feeding, massage and strichninae injections, but the mental as well as physical backwardness was marked. The child did not speak at all, and gave no sign of recognizing anyone, even those who had cared for it for a long time. The movements of the fingers almost suggest athetosis. Whether malnutrition alone accounted for the mental defects or whether the cerebral development was arrested could not be determined. Dr. Miller, while admitting that abdominal tuberculosis was possible, inclined to a diagnosis of extreme intestinal atony, due to rickets and intestinal catarrh, and the brief discussion following agreed in general with his conclusion.

Congenital Obliteration of the Bile Ducts.—Dr. J. P. Crozier Griffith read a paper on this rare cause of icterus in the newborn, with report of a case. A child, ten days old, with a negative family history, and born at term, was brought to the hospital with severe jaundice. Nothing wrong had been noticed during the first three days after birth, meconium passing per rectum up to that time. Then the mother noticed jaundice. Some infection of the cord became apparent; the stump fell about the eighth day. The child was small and emaciated, skin and conjunctivae extremely icteric, pulse feeble and rapid; respirations accelerated. No food could be retained. Constipation was absolute, and bile present in the urine. Death took place twelve hours after admission to the hospital. The autopsy showed a complete obliterating stenosis of the common bile duct about a quarter of an inch above its opening into the intestine. The lesions characteristic of this disease consist in obstruction somewhere in the biliary passages. The bile ducts may be wanting or imperfect, or represented by a fibrous cord. They may be apparently normal but with the lumen obliterated. The gall bladder may be absent, or much dilated. The liver is generally firm, dark green or of a natural color and exhibits some lesions of hypertrophic cirrhosis. The cause is often obscure. The fact that several cases in the same family are reported in several instances would suggest a congenital failure of development. In other cases the existence of an obliterative inflammation seems probable. The chief symptom is icterus, next in importance being acholic stools. Vomiting is apt to occur, also hemorrhages from the cord. Death occurs in convulsions or sopor or from exhaustion, usually after a course several weeks or even months. There is great difficulty in distinguishing congenital obliteration of the bile ducts from other forms of severe icterus. Cases are on record with recovery, which, if they had terminated fatally, would have been diagnosed as congenital obliteration of the duct, and others in which death probably resulted from some acute cause, as catarrhal inflammation, totally closing a congenitally narrowed but not obliterated passage. The prognosis, if the obliteration is complete and organic, is absolutely bad, and treatment can be only palliative.

Dr. La Roque reported on his findings at the autopsy on the case described, and several members added remarks which tended to indicate that when biliary cirrhosis is found in conjunction with the stenosis the latter is the primary condition. In reply to a question Dr. Griffith said that fever is not a symptom in obstruction.

Primary Right Dorsal Scoliosis in Infant.—The case of a child developing lateral curvature at the age of eleven months was reported by Dr. H. C. Carpenter. There was no history of traumatism, and the family showed that the mother had had several miscarriages and premature births. This child, however, was born at term in easy labor. An attack of enteritis at the age of six months is the only illness it ever had. It is poorly nourished and deficient in muscular development, was breast fed for six months and since then has had broth, crackers and milk and potato. There are no subjective symptoms, no pain or tenderness, no evidence of rickets.

THE DIETETIC USE OF PREDIGESTED LEGUME FLOUR.—Drs. Edsal and Miller presented a paper on this subject, with special reference to the diet of atrophic infants. Such flours have been occasionally used for some years, but the matter has not been studied. They can be used in small quantities only, and they are not easily digested unless predigested. The series of cases studied is not large, and the results therefore somewhat tentative in character, but there is evidence that the bean proteid is readily absorbed, and that it affects metabolism fully as much as milk, or even more in the case of atrophic infants. After malting the bean flour was given in a milk mixture.

Dr. Griffith explained his interest in Dr. Edsall's experiments, and commented on the value of the results which demonstrated scientifically that the proteid in question was a valuable substitute for cow's milk.

In response to inquiries Dr. Edsall said that the experiments had not been tried on acute cases, although a number of the babies were just recovering from such. He thought that this diet enables the proteid to be increased in cases where such an increase by means of milk was not well borne, whereas the amount of milk could be adjusted to the individual case and thus guard against scurvy and similar nutritional disorders. Temporarily, also, the food could be used exclusively, since it furnished sufficient nitrogen. He had so used it in one desperate case, with success. Apparently it is easy of digestion.

NEW YORK ACADEMY OF MEDICINE.

SECTION OF ORTHOPEDIC SURGERY.

Meeting of March 17, 1905.

DR. HOMER GIBNEY, Chairman, in the Chair.

Dr. Whitman presented the following cases:—The first patient, a girl eleven years of age, illustrated the practical cure of equino-valgus deformity, caused by paralysis of the tibialis anticus muscle. This operation, which he had described before on several occasions, was conducted as follows: The tendon of the longus hallucis was divided, drawn through a hole bored in the navicular, looped over and sewed to itself and to the shortened tendon of the tibialis anticus, at a sufficient tension to hold the foot in slight dorsal flexion. Arthrodesis was then made between the head of the astragalus and the navicular and the two bones were sewed to one another with strong silk. The foot was then placed in an attitude of moderate varus and a plaster bandage applied. Soon after, the patient was encouraged to walk about, the plaster apparatus being retained for about three months in order to impress the new attitude upon the foot. This operation was, as in this instance, as a rule so effective that no apparatus was required.

It might be noted that the accessory tendon of the great toe was sufficient to hold it in proper position.

CASE 2.—This patient, a boy of six years of age, illustrated the effect of the Phelps' open incision in correcting club foot. He had performed a number of these operations recently in a type of cases familiar in hospital practice in which, because of neglect of after treatment, a certain degree of varus presisted. He thought no operation was as effective as this in assuring a permanent result in cases of this class.

CASE 3.—This patient, a girl sixteen years of age, came to the hospital from Porto Rico. She presented a congenital club foot that had never been treated, and yet the deformity had been completely over-corrected by forcible manipulation without dividing a tendon even. The case was presented to contrast it with the preceding, as an illustration of the fact that the resistance of congenital deformities of this class by no means corresponds to the age of the patient. It was his custom in the treatment of club foot in youth, and adult age, whenever possible, to divide the operative treatment into several sittings, forcible correction always preceding more radical procedures. In this case the correction was easily accomplished in three operations.

CASE 4. EXCISION OF THE ANKLE FOR TUBERCULOUS DISEASE. —The patient, a woman twenty-five years of age, was admitted to the Hospital for Ruptured and Crippled last summer. She presented advanced tuberculous disease of the ankle of three years' duration. On investigation the disease was apparently confined to the astragalo-tibial joint. The astragalus was removed and in order to eradicate the disease of the tibia it was necessary to open its medulary cavity. It would be noted that the result was not only a cure of the disease, but free motion had been restored. The ankle joint was most favorably constructed for radical treatment since, as in this instance one might not only remove the disease, but restore function. Another point was of interest in view of the question of plugging cavities in bone with iodoform filling, that although this might have been tolerated the patient's condition could hardly have been improved by such treatment.

CASE 5. TENDON TRANSPLANTATION FOR SPASTIC HEMIPLEGIA.—This patient, a girl eight years of age, presented on admission to the hospital the ordinary equino-varus deformity accompanying hemiplegia. The contractions having been overcome, the tendon of the tibialis anticus with the lower portion of the muscular substance was divided into equal parts, and the outer half was attached to the cuboid bone. The foot was fixed in the over-corrected position by a plaster of Paris bandage for several months and the original deformity appears to have been overcome. In cases of this class it must be borne in mind that the operation simply restores in some degree the balance of the foot, but that cure can only be assured by constant supervision.

TORTICOLLIS.—Dr. Homer Gibney showed a case of torticollis. The boy was admitted last November, Dr. Gibney's service. He held his head inclined to the right, chin pointing over right shoulder—a compensating lateral dorsal curvature. Tendons of the sternocleido mastoid were divided subcutaneously, after which a jacket and jury mast were applied. The jacket was continued until within the past week, when it was removed. There is no limitation of motion, no scar, spine quite straight and deformity entirely overcome.

OSTEITIS.—Dr. Myers presented a case of injury to the cervical vertebrae, with symptoms of osteitis. Probably fracture of the second cervical vertebra. Cured with perfect motion in five and a half months.

M. P., boy four years of age. October 1, 1904, fell out of bed, turning a somersault. His two brothers fell on his neck. When his mother picked him up he seemed to have no power in the muscles of his neck, his head falling from side to side. He was put to bed; no other treatment.

October 22, 1904, first seen by Dr. Myers at St. Luke's Hospital. Head was held a little flexed, not rotated to either side and all motions of neck, especially rotation, were markedly restricted by reflex muscular spasm. Great tenderness over second cervical vertebra. Reflexes increased, but no disturbance of sensation below the point of injury.

T. 98.8 R. 28 P. 86. He was put on a Bradford frame, with his head tied down.

November 15, motion increasing somewhat in all directions. Second cervical vertebra still tender. Skiagraph shows no dislocation. Reflexes normal.

November 21, retention head brace applied. Bradford frame continued.

January 28, 1905, no vertebral spines especially prominent. Rotation to right and left 60 degrees. Inclination to right and left 60 degrees. Flexion and extension but slightly restricted now. No pain.

February 2, 1905, brace removed, and five days later he was allowed up.

February 21, 1905, no deformity. Motions free. No pain or spasm. Discharged cured.

Hereditary Syphilis.—Dr. Charlton Wallace showed a child nine years of age, a typical case of hereditary specific disease. It is interesting, because one sees few of these in orthopedic hospitals and clinics. She has osteo-periarthritis of both knees, ostitis of both tibias and two or three ulcerations. She was sent to Sea Breeze Hospital, an experimental institution, for the sea air treatment of surgical tuberculosis, last June. Was seen in November and it was diagnosed then as specific. There was much tenderness then over both tibias, but this has disappeared under potassium iodide treatment. She cannot stand erect and the knees are held at an angle of 170 degrees, but the joints are not specially painful. Her general condition has much improved, and she has gained eight pounds in weight. She was discharged in March, there being no evidence of tuberculosis.

Equno-varus.—Dr. Hibbs presented the following cases.

J. K., boy aged three years, entered the New York Orthopedic Hospital June 21, 1904, with both feet in a position of marked equino-varus. The deformities of his feet were corrected by manipulation under ether at several different times. After this, however, there remained such an amount of twisting of the tibias that it was necessary to do an osteotomy on both. This operation was done January 13, at the junction of the middle and lower third. It was necessary to rotate the lower fragment with the foot outward about 60 degrees to correct the deformity. There was little difficulty in the treatment of the deformity of the feet, but this condition of twisting of the tibia sometimes seen in such cases cannot be overcome except by osteotomy.

K. C., girl, aged 11 years, entered ward June 17, 1904, with feet in a position of equino-varus, slight amount of internal rotation, no twisting of tibias. Walked on dorsal edge and outer aspect of foot, where there was a great callus.

July 11, stretched and put up in plaster.

July 20, stretched and put up in plaster.

August 1, stretched and put up in plaster.

August 13, tendo achilles lengthened 1½ inches in both legs. Feet placed at 90 degrees in plaster.

Boy, aged three years, entered ward October 19, 1903, with a paralysis of the small finger, the result of severing a branch of the ulnar nerve.

October 23, the branch of the ulnar nerve supplying the little finger was sutured and the hand put up in plaster.

November 14, dressing removed, wound healed. Nerve showed signs of beginning to revive.

December 4, no evidence that the function of the nerve had been restored, as there was still loss of power in the flexors of the small finger. Discharged.

This boy had not been seen by Dr. Hibbs again until March 16, when it was observed that there was power in that tendon. The boy does not use the finger quite properly yet, but neurologists who have seen the case say he is steadily gaining ground.

EDITORIAL

ILL-NOURISHED CHILDREN: ANOTHER PHASE OF THE QUESTION

The subject of the nourishment of the children of the poor has attracted considerable attention of late, as the public awake to the realization that sickly children cannot make strong men and women, and that such men and women are a matter of vital importance to the nation. One phase of the question has been handled more directly in Boston than elsewhere, and some of the results noted there may be commended to the attention of other cities, especially New York.

In a recent discussion in the latter city regarding the children who go breakfastless to school, one whose experience warranted knowledge of the matter said that often a mother, going early to work, would give a child a few pennies and tell him to get his own breakfast. The child was apt to be attracted to the cheap candy counters which abound in the poorer districts, and there spend his pennies for sweets which at the best consist of glucose, vegetable dyes and paraffin, and at the worst of an insoluble form of paraffin and deleterious coloring matter. That this candy eating habit is largely prevalent among the children of the poor no one can doubt who has even a casual acquaintance with the regions where they live, and such an acquaintance provides a lively recollection of the counters spread with wares exposed to the dust and filth of the street.

It is true that the Board of Health inspects the stock of these small dealers, and has power of confiscation as regards the wares containing matter actually poisonous. But this does not reach the vast majority who deal in stuff which is merely an inadequate substitute for the food which the little bodies need. Naturally, after dumping a quantity of these cheap sweets into his stomach the child experiences loss of appetite, if not a more serious disturbance of digestion, and the continued use of such substances results in disorders of the stomach, anorexia, anemia and loss of power to resist disease.

In view of these facts, the United Workers of the South End in Boston opened a pure candy counter in the Hawthorne Club playground, and it has proved a success from the first. The children readily grasped the idea that as the candy was a better quality they could not get so much for a penny, and the taste for wholesome and dainty sweets was easily cultivated. At first only plain sweet chocolate and peanut balls were sold, furnished by Huyler's management at wholesale prices and sold to the children at cost.

Later, when the playground was closed in the autumn and the clubhouse opened, another counter was instituted with a larger variety of simple candies. The cooking classes of the club took up the manufacture of peanut brittle and similar candies, and were able to sell them at nine cents a pound.

At Lincoln House also the pure-candy question has been taken up successfully, in this case through a preliminary mothers' meeting, at which the ingredients of cheap candy were shown separately and the point made clear that in buying such candies the purchaser did not get his money's worth.

The objection has been raised that children in such a position ought not to spend money for candy anyhow, and should be discouraged from doing so and taught to save pennies, but "it is a condition that confronts us, not a theory," and so long as the cheap candy counter besets the child's steps at every turn it is folly to talk of stopping all expenditures in that direction. The best that can be done is to provide an opportunity for getting his money's worth in pure, wholesome sweets, and possibly at the same time, if the candy counter is under the charge of the settlement worker, gain his confidence sufficiently to persuade his pennies ultimately into wiser channels.

OSTEOPATHY ON THE STAGE

Despond not, O Osteopathy, though medical societies be hostile and State senators obdurate. Rather proclaim: "Let us make the drama of a country and we care not who makes the laws." The play is mightier than the code, and "Mrs. Leffingwell's Boots" have nightly marched to triumph all winter at the Lyceum, a triumph most justly thine, O goddess of the insinuating punch, the subtle twist and the mighty pull.

Never since the days of Euripides was such a handy *Dea ex Machina,* with such an effective field of action.

Mr. Thomas has done his work well, and his mischievous element in the shape of a young man not quite crazy enough to be locked up or even recognized as such by his family, but possessed of moral obliquity which dictates cunning and shameless schemes for the procuring of money, is worked up with a verismilitude easily recognizable by anyone who has had dealings with that particularly trying type of mental disorder. Given such a man, with the opportunity afforded by a jealous husband, ready to pay a "private detective" for tangible proofs against his wife, and the appearance of the lady's boots on another man's fire escape is easily deduced. Then for the purpose of the drama, pitchfork the various victims of the irresponsible villain into a suburban country house, marooned there by the "worst blizzard since Roscoe Conklin died," with all the complications and excitements made possible by unexpected guests and supplementary servants, introduce the young man himself, once more on cash intent, and then—Osteopathy to the rescue!

Just "one of the cervical vertebræ impinging on a nerve" was the root of all the evil, and "made a crook out of a remarkably straight boy," and as soon as the old doctor, himself a convert by a similar experience, gets in some of his osteopathic fine work on him, the crook is straightened again, all his misdeeds confessed and forgiven, and we "leave 'em all in couples, a-kissing on the decks." 'Rah for Osteopathy! It is so charmingly easy and expeditious—morals mended while you wait! No tedious and patient efforts at reform through education, nor even the comparatively lengthy miracles of trephining, with the implication of hospitals and slow recovery. Just catch your crook, and the rest is accomplished in an artist's studio before breakfast!

What glorious vistas open before the creative imagination as these results are contemplated! Who knows how much disaster and expense the country over is due to impinging vertebræ? The suggestion is irresistible of an osteopathetic clinic with long rows of convenient couches and muscular operators, receiving a stream of dangerous criminals and lunatics and turning them out valuable members of society.

And even now that Mrs. Leffingwell's Boots no longer pursue their blithe career in the midst of us, the good work still goes on; for the lesson of the stage has been taken to heart by that moulder of public tastes, manners and morals whose existence implies that of hope, and Osteopathy shares with Antivivisection the valiant defence of *Life's* freelance.

ABSTRACTS

Giant Growth of the New Born.—Jacoby (Archiv f. Gyn. lxxiv, No. 3) reports that of 6,796 children born at the Mannheim Maternity Hospital, 5.87 per cent. weighed 4,000 gm. or more. The longest duration of pregnancy in these cases was 349 days, the shortest 247 days. The author advocates artificial premature delivery as the best means of avoidinug danger in the delivery of these large children. He also gives a comparison of the data of different clinics in regard to the various aspects of fetal giant growth.

Childbirth in Cases of Giant Growth—Starcke (Archiv f. Gyn. lxxiv, No. 3) reports from Leopold's clinic in Dresden that of 34,000 children born there 3.43 per cent. weighed 4,000 gm. or more. Sixteen weighed 5,000 gm. each, and seven of these were spontaneously delivered. About 10 per cent. did not survive delivery. In only a small number were extraordinarily long pregnancies noted.

Cessation of Epilepsy Consequent on Removal of Adenoids.—St. Clair Thomson (The Practitioner, Apr., 1905) describes a case of a little girl who was sent to him by Dr. Ferrier, with the following note:—"She is under my care for *petit mal*, but she is getting deaf, and there are signs of some throat affection—probably adenoids. I am sure the epilepsy will also be benefited by the removal of this discomfort." The child was six years of age, and on inquiry it was stated that she had been subject to fits from the age of four. Two attacks of *petit mal* occurred during her visit to my study, i.e., two fits within twenty minutes. During these her head was thrown back, the eyes turned up, the upper eyelids twitched, and the inspiration was shallow and noisy. Each attack only lasted a few seconds, and the patient recovered consciousness without falling from her chair. The parents reported that she had caught a cold a month or two previously, and had since been noticed to be deaf and a mouth-breather. She was also said to be very restless in bed; talking in her sleep, and throwing off the clothes, but there was no enuresis. As is well shown in her photograph, the child had a marked adenoid facies. She was a constant mouth-breather; the root of the nose was very broad; and the inner fold of each upper eyelid, which by some is thought to be accentuated with adenoids, was well marked. She was said to have a dry nose, and anteriorly the nostrils appeared normal. The molar teeth had not fallen, but the palate appeared a little arched. The child was deaf, so that whispered speech was heard only at a distance of two yards. The mebranae tympani were very translucent, only slightly retracted, and the pink injection of the inner tympanic wall was easily visible, shining through the drum membrane. In children this appearance is very characteristic of Eustachian and middle-ear catarrh from adenoids, and, with digital examination, these growths were found to be plentiful. There were no palatine tonsils. It was explained to the parents that the removal of the adenoids was unquestionably indicated on account of the condition of the ears, and would probably prove beneficial in other directions. A large mass of adenoids was removed on August 25, 1898. On September 7 the patient had ceased to be a mouth-breather; the membranæ tympani no longer showed pink; and she heard a whisper at four yards. She was reported to sleep quietly and to be much brighter in herself, but the fits still continued. I did not think of writing to the parents for four years, and then (in 1902) they reported that the fits had ceased within a few months of the operation, and had not recurred. The next time I saw the patient was in March, 1904. She was found to be a very self-possessed, bright, and intelligent girl of 12, weighing 6 stone 8 pounds, i.e., more than 16 pounds above the average. She is no longer a mouth-breather; she has no trace of adenoids, and her hearing is perfect. There is no marked arching of the hard palate. The parents reported that for a few months after the operation she continued to take bromide under Dr. Ferrier's advice, but that the fits left her—as already reported—soon after the operation, and had not recurred. She had taken no bromide for six years. She is at the present moment nearly 13 years of age, and has had no fits for seven years. I have had other cases where adenoids have been removed in epileptic children without the satisfactory result above recorded, but I am prompted to put even one success on record. For there appears to be a general consensus of opinion that the most unsatisfactory cases of epilepsy are those in which the disease commences under 10 years of age they show the smallest percentage of recoveries, and the largest number of confirmed cases.

Cerebellar Abscess — Operation — Recovery.—A. Hum Griffith (Scottish Med. and Surg. Journal) reports the fo lowing case. The diagnosis was rendered more difficult b the patient being the "host" of innumerable round-worm (Ascaris lumbricoides). The patient (Jameel), a boy age seven, was brought to the C. M. S. Hospital, Nablûs, Palestin on the 30th day of August, 1904, by his mother. She said that, fourteen days before, he had been playing with his brother, and the latter had in fun thrown an iron skewer (used commonly in Palestine to string lumps of meat on), which struck him on the head a little below and to the right of the occiput. The skewer made a slight wound but fell to the ground, and the child cried for a little while and then resumed playing. A few days later the mother noticed that the child grew listless, complained of pain in his head, and seemed unable to walk. He ceased to care for his food and vomited frequently; so, after waiting a fortnight, she decided to bring him to the hospital. On examination, a small suppurating scalp wound was found about an inch to the right and below the occiput; this being enlarged, and the wound being carefully examined digitally and with a probe, no fracture of the skull could be discovered. During the examination the child vomited two long round-worms. The patient seemed dazed, pupils were enlarged, more especially the right, and he staggered on attempting to walk. The patellar reflexes were very sluggish, organic reflexes normal: pulse 58: temperature 98.4 degrees F. He was admitted as in-patient to the hospital. September 10.—Since admission, the patient has steadily grown worse. Santonin was administered, and the child passed "dozens" of round-worms. The temperature remains normal, the pulse-rate varying 58-68-80-96-102-96-96-88-68. The patient sometimes complains of severe pain in the head, but usually lies in his cot in a drowsy condition. The right pupil is widely dilated, patellar reflexes have vanished, and there is some incontinence of urine and loss of rectal control. Considering the evident serious condition of the child, it was resolved to operate immediately. Under chloroform I made a horse-shoe shaped incision—with the base downwards—over site of injury, cutting down to the bone and reflecting the whole flap. Hardly had the hemorrhage (which was profuse) been controlled when the child stopped breathing, and my colleague (Dr. Gaskoin Wright) and I had to, in turn, perform artificial respiration for half an hour before the breathing became again regular. It was noticed that during the whole of this time the pulse-beat was regular in time and rhythm. The operation was abandoned, as it was inadvisable to run the risk of the child dying on the operation table. However, on examining the bare skull a pin-point puncture of the occipital bone was observed an inch to the right, and below the occipital protruberance. September 12.—Having obtained the consent of the relatives, CHll3 being cautiously administered, I trephined over the punctured bone, a little below the right lateral sinus. On the removal of the plate of bone, a fracture (comminuted) of the inner table of the skull was found, the fragments of bone being firmly embedded in the dura mater. These were cautiously extracted. There was no visible pulsation of the brain, but it could be felt pulsating on pressure. The dura mater being tense and bulging somewhat into the wound, an exploring needle was plunged into the brain; a little serum followed by pus exuded; then a cataract knife was entered in the track of the needle (inwards and slightly downwards), and from the incision some two to three ounces of thick pus was evacuated. The whole of the right cerebellar lobe seemed to have been converted into an abscess cavity. An indiarubber drainage tube was then inserted, just into the mouth of the abscess cavity, and the horse-shoe flap allowed to fall over into place. After evacuation of the abscess cavity, the brain substance was seen to pulsate.

The patient bore the operation well, and his respiration improved as soon as the pus was evacuated.

September 13.—Patient passed a good night. Seems brighter and more intelligent. No longer complains of pain in the head. Pulse 120. Temperature 99.2 degrees F.

September 14.—Temperature 101.6 degrees. Pulse 124. The wound was dressed. Tube found not to be draining properly, so fresh one inserted. Discharge more serous than purulent.

September 15.—Temperature 99.2 degrees. Pulse 120. Patient much better. Knee reflexes have returned. Pupils (especially right) much smaller.

September 17. Temperature 99.8 degrees. A worm powder having been administered the previous day, patient passed eight worms.

September 20.—Temperature normal. Pulse 112. Wound dressed. Very little discharge. Granulations quite healthy.

September 21.—Right pupil no longer dilated. Child has evidently received full power in limbs.

October 3.—Drainage tube removed. No discharge. Whole wound healing rapidly.

October 9.—Temperature 102.6 degrees. Worm powder ordered.

October 10.—Temperature 99 degrees. Passed many worms.

October 11.—Wound in scalp healed. Patient allowed out of bed; has full use of limbs.

October 13.—Temperature 101 degrees.

October 14.—Temperature 99 degrees. Passed more worms.

October 18.—Discharged cured. Able to run races in the ward.

Patient was seen again a month after discharge from hospital, and there had been no return of symptoms.

Epithelioma of the Face in a Young Child.—M. J. LIPPE (Courier of Medicine, May, 1905), reports the history of a case as follows: Beatrice B., a girl, aged four years, has never been ill, excepting the affection for which she was operated on, which constitutes the basis of this report, and is a normal child in every way. Father and mother living and healthy; has a brother and sister, both healthy; no history of malignant trouble in the family. About six months ago she developed three small flat warts, two below the inner canthus of the right eye and the third along the side of the nose, above the nasolabial fold. After they had been noticed for three months, the lower one (the one on the side of the nose) began to grow: the father of the child tried to pinch it off a number of times, but it grew in spite of his efforts. The author saw the child on January 16, 1905, and at this time observed the following: Two small warts, as above described, below the lower canthus of the eye; above the nasolabial fold was a warty-looking growth about one-third of an inch in diameter, raised above the surrounding skin. The color of the base of this growth was slightly red—dark-red, but not inflammatory looking; the top of the growth was grayish looking, like verrucous tissue, with a tendency to breaking down in the center. A lymph node at the angle of the jaw was enlarged somewhat. A similar condition in an old person would have impelled one to make a positive clinical diagnosis of epithelioma, growing on a wart, but occurring in a child of such tender years one would hesitate to make such a diagnosis unsupported by a microscopical examination. He told the parents that it was a nasty looking thing and that it was possibly malignant. They consented to an excision which he advised. The tumor was removed three days later, and sent to Dr. Carl Fisch, who reported a typical epithelioma. This is the report in detail.

Dear Doctor.—The small tumor (about 2.5 mm. in diameter in its alcohol hardened condition) removed by you from the right nasolabial fold of a child, and submitted to me, was found to be a typical epithelioma or a cancroid. Its center had through cornification led to a defect in which granular detritus and inflammatory exudate formed a plug. The peripheral zone of the tumor had grown under the adjoining epidermis, compressing and obliterating it: it was preceded by an area of inflammatory changes in the corium, leading to an elevation above the normal of the epithelium. The interpapillary processes of the epithelium in this zone were seen to be wedged out in a direction away from the tumor mass. In its central portion the tumor had penetrated beyond the elastic layer of the subcutaneous tissue, sending into the corium smaller and larger processes. The tumor is, therefore, an epithelioma, that had its origin from the cutaneous epithelium. It was not in direct continuity with the latter, but everywhere well-defined from it. Yours truly, Carl, Fisch, M.D.

Pneumococcus Arthritis in Infancy. — NATTAN-LARRIER (Archiv. Gén. de Méd., Feb. 28, 1905, p. 529) records what he believes to be the first published case of pneumococcus arthritis in an infant. On the nineteenth day after birth the child showed evidence of affection of the right shoulder-joint; on the following day this was plainly swollen, and two days later the child, who was greatly wasted, died. In 28 out of 32 cases investigated by the author, the arthritis was obviously secondary to pulmonary or broncho-pulmonary disease, but in the above case it was not. The origin of the disease must, therefore, have been due either to direct transmission from the mother or to infection from some local lesion. The mother was perfectly healthy and the interval of twenty-one days between the birth of the child and the occurrance of the arthritis also seemed to negative this hypothesis. The only local lesion from which the child suffered was a suppurating wound in connection with a harelip. At the autopsy the pus from this wound was found to contain pneumococci, and the fluid in the right shoulder-joint contained them in large numbers, but there was no pneumococcal infection of any other structure in the body. In view of the frequent presence of the pneumococcus in the healthy mouth, it was presumed that the organism had gained access through the wound in the lip to the general circulation, and had established itself in the right shoulder-joint, owing to its resistance having been lowered by an injury to it during a difficult labor in which the presentation was occipito-posterior. The general infection was probably favored by the weakly state of the child, its ill-nourishment being apparently associated with the pain it experienced in the lip on being suckled. The author refers to Cave's observations, according to which there was a determined local cause in 10 out of 32 cases of pneumococcus arthritis.

Urotropine in Scarlet Fever.—K. PATSCHKOWSKI (Therap. Monat., Dec., 1904) recommends that urotropine be given in all cases of scarlet fever, with a view to the prevention of nephritis. Widowitz first published an account of such a use of urotropine, and claimed to have treated 102 consecutive cases of scarlet fever without the occurrence of nephritis in any case. Patschkowski has used urotropine in 52 cases of scarlet fever at the Charlottenburg Hospital. Two methods of administration were employed. To 8 of the patients the drug was given on each of from ten to twenty-one consecutive days; the dose for children being 0.25 gram, and for adults 0.5 gram, three times a day. To the remaining 44 patients urotropine was given on each of three or four consecutive days, and a break of five days was then made before the administration of the drug was resumed. The treatment was begun as soon as the patients were admitted—that is, as a rule, before the end of the third day of illness. Of these patients, 2 only, or 3.8 per cent. of the whole number, developed nephritis, in spite of the fact that the fever was of a peculiarly severe type. In no instance was any harmful side-effect of urotropine observed. In addition to the cases already mentioned 10 others are especially mentioned. One was that of a patient admitted on the seventh day of illness with nephritis already present. After two days' treatment with urotropine albuminuria permanently disappeared. The other was that of a child treated with urotropine, who died on the twelfth day of the fever. At the post-mortem examination, endocarditis, pericarditis, pleurisy, a recent infarct of the spleen and peritonitis were all found, but the kidneys were normal. Some statistics are given to show the frequency of nephritis in scarlet fever treated on ordinary lines, and a consideration of them shows more clearly the value of the urotropine method. Heubner states that nephritis occurred in 10 per cent. of 318 cases of scarlet fever seen by him in private practice, and in 19.6 per cent. of 393 cases in hospital practice. At the Charlottenburg Hospital, in the two years before the administration of urotropine was introduced, 225 cases of scarlet fever were treated. After subtracting those cases in which death occurred soon after admission, or in which nephritis was present on admission, 177 cases remain. Among these there were 37 cases of nephritis, or 20.9 per cent., as compared with 3.8 per cent. when urotropine was used. The author suggests that urotropine may prove to be useful in cases of sepsis: for example, in puerperal sepsis.

Pneumococcic Membranous Bronchitis in a Child.—P. Menetrier (Bulletins de la Soc. Méd. des Hopitaux, Dec. 9, p. 1177).—The following case is of interest in consequence of the rarity of membranous bronchitis at such an early age apart from diphtheria. A child, aged two years and two months, was brought to hospital on March 1, 1904. For two months he had expectorated arborescent membranes after fits of coughing and suffocation. There were 2 other children in the family, aged respectively three and four years, who were in good health. When he was 8 days old he contracted bronchitis after exposure to cold, and the attack lasted more than 3 months. At four months he had another attack which lasted the same time. In January, 1904, he had a third attack which, like the preceding ones, was attended by fever and cough without expectoration. But the cough was more severe and on February 7, he expectorated, after a violent fit of coughing in which suffocation seemed imminent, a mass of whitish membranes which on being spread out in water were found to consist of ramified tubes. Since that time fits of coughing occurred nearly every day, but only every 3 days were membranes expectorated. He lost appetite and wasted. He was pale and thin. The throat was normal. The upper two-thirds of the left chest in front and behind were slightly dull on percussion and the breathing was bronchial and accompanied by large subcrepitant râles. The temperature was normal. Membrane was produced which looked somewhat like macaroni and was as firm as that of diphtheria. It formed a ramified mould of a whole pulmonary lobe without any central cavity. After Mar. 1 he expectorated no more membrane and had no attacks of suffocation. The cough diminished and he recovered appetite. On Mar. 5 the dulness and the bronchial breathing were still heard but no râles. After 2 months he was said to be quite well, but no further opportunity for examination was given. The membrane contained pneumococci in large numbers and yielded the pneumococcus in pure culture. A mouse inoculated with it died from pneumococcic septicemia. The membrane was composed of stratified layers of fibrin, leucocytes, and cubical epithelial cells of the type found in the capillary bronchi. Nowhere was there any ciliated epithelium of the type found in the larger bronchi. The writer concludes that the capillary bronchi were the seat of the disease.

Incontinence of Feces in Children.—M. Ostheimer (University of Pennsylvania Med. Bulletin, Feb., p. 405).—Though incontinence of urine is common in childhood, incontinence of feces has been seldom described; only about a dozen cases have been recorded. They may be divided into those in which some cause was found, and those in which the disorder was ascribed to the general nervous condition of the child. The second group has been subdivided into cases persisting from infancy, and cases in which the condition appeared suddenly, in children over the age of 3 years. The cause was either general, such as wasting disease, epilepsy, general paralysis, or the infectious fevers; or local, such as stretching of the sphincter from the prolapse of the rectum or impaction of feces or operations near the anus. In 3 cases the incontinence was due to distention of the rectum with feces in cases of chronic constipation. Incontinence began in a boy, aged 6, after constant constipation. At the age of nine, when he came under observation, the sphincter was found relaxed (Wallace, St. Bartholomew's Hosp. Reports, 1888, p. 260). Rivière reports a similar case in a girl, aged twelve, in whom incontinence was first noticed at nine; the rectum was evidently distended (Med. Moderne, 1898, ix, 308). Castor oil enemata were given for a week daily and permanent recovery followed. In 2 cases the incontinence had existed since infancy without known cause. Mendenhall reported a case in a boy, aged sixteen years. The incontinence began at the age of six months, after an attack of constipation. Under strychnine and ergot he eventually acquired control over the motions. In a similar case in a girl, aged thirteen, recovery took place under this treatment. The sphincter was relaxed. A case of incontinence of both feces and urine which existed from infancy in a boy, aged 8, is reported by Griffiths (Archives of Pediatrics, 1899). Under increasing doses of tinct. belladonnæ for 6 weeks the incontinence of feces disappeared, but nocturnal enuresis persisted. He was very nervous and had choreiform twitching with nocturnal and diurnal enuresis. Three months later the incontinence of feces recurred, but disappeared again under treatment. In 4 cases there was incontinence of feces alone. In 1, a boy, aged 7, after over-study suddenly developed incontinence of feces. The sphincter appeared normal. After 3 weeks of treatment (fresh air and the administration of ergot) recovery took place. In 2 other cases the incontinence was due to the same cause. In the text-books there are few references to incontinence of feces in children. Goodhart and Still state that the patients nearly always show mental instability. The following cases have been observed by the writer.

Case 1.—An emaciated boy, aged ten, was seen. At seven he had diphtheria and 6 months later scarlatina. Thereafter he lost weight and power in all his muscles. He had difficulty in swallowing and fluid regurgitated through his nose. Incontinence of feces had existed for 2 years. Under nutritious diet, fresh air and tonics he recovered in 6 months.

Case 2.—A big strong boy, aged six and one-half, was seen. Until the age of four he had both nocturnal and diurnal enuresis. Nine months before he was seen he suddenly lost control of the anal and vesical sphincters, after having been kept indoors for several weeks. The anal sphincter seemed normal; the prepuce was very long but without adhesions. Under fresh air, exercise, atropine, and strychnine he at once improved. Three relapses followed: recovery rapidly took place under strychnine and atropine (1-10 gr. of each daily).

Case 3.—A healthy looking well-developed boy, aged four and one-half, had had incontinence of feces and urine for a year. There were paroxysms of pain on micturition and hematuria. Under good food, fresh air, and strychnine the incontinence of feces disappeared in 10 days, but the incontinence of urine persisted. A vesical calculus was found and removed and he completely recovered.

Measles without Characteristic Eruption.—J. D. Rolleston (Lancet, Dec. 10, p. 1640).—A girl, aged five, was admitted to the Grove Fever Hospital on Sept. 12, 1904, the third day of an attack of scarlatina. The rash was fading and by Sept. 19 had entirely disappeared. Characteristic desquamation followed. There was slight albuminuria. On the 26th temperature, which had been normal, rose to 99.6 degrees at midnight. On the following day she vomited, an erythema appeared on the body, and the fauces and soft palate were injected. The temperature at 8 p.m. was 102 degrees. During the night she coughed several times. On the 28th the rash had faded but the pyrexia persisted; the morning temperature was 100.2 degrees and the evening temperature was 101 degrees. Nothing fresh was noted on the 29th. The temperature was still slightly raised (in the morning it was 99.8 degrees and in the evening 100 degrees) and the cough continued to be frequent. On the 30th at 2 p.m. the buccal mucosa was found to be injected and showed 3 definite Koplik's spots. An urticarial wheal was seen close to the umbilicus. The temperature was 100 degrees. At 11 p.m. several urticarial wheals were seen on the trunk, the cough was troublesome, and there were profuse coryza, and signs of bronchitis. The temperature was 101.2 degrees. On the 31st the urticaria and Koplik's spots had disappeared. No other eruption was seen though search was made several times in the 24 hours. The coryza and the bronchitis persisted till Nov. 3, when the temperature finally became normal. Convalescence was uneventful. No desquamation followed and the child was discharged on the 18th. The child had previously suffered from measles, in July, 1903, when 3 other members of her family were attacked.

Of all the exanthemata, measles least frequently assumes anomalous forms. But their existence has been recognized since Sydenham differentiated measles from scarlet fever and non-eruptive measles, "morbilli sine morbillis" or "rubeola sine exanthemata." Willau first described "rubela sine catarrho." But some authorities have denied or doubted the specific nature of these conditions.

In the present case the diagnosis was based on the occurrence of several other cases of measles in the same ward and the presence of catarrhal symptoms, pyrexia, Koplik's spots, and the prodromal erythematous and urticarial eruptions. The erythema was at first taken to indicate a relapse of scarlet fever owing to its appearance preceding the catarrhal symptoms, its association with the injection of the fauces and soft palate (morbillary enanthem), and the occurrence of vomiting, which more often precedes scarlet fever than any of the other eruptive fevers. The mistaken diagnosis of a relapse of scarlet fever accounts for the paucity of Koplik's spots which were fading when first seen. They would probably have been found to be more numerous had the suspicion of measles prompted examination of the buccal mucosa at an earlier date.

The cause of the abortive nature of the disease was partly the character of the epidemic and partly the incomplete immunity acquired by the previous attack. In 3 out of 7 other cases infected simultaneously the measles eruption never reached the distal parts of the limbs. The partial protection afforded by a previous attack of measles is well illustrated by H. Balme, who quotes 13 cases, in all but one of which there was a very mild second attack. Two of these were instances of morbilli sine morbillis, the diagnosis being established on the characteristic symptoms, the presence of Koplik's spots and the spread of infection to other members of the family.

Tobacco Deafness.—Dr. Delie (Rev. Hebd. de Laryngologie, d'Otologie et de Rhinologie, Jan. 28, p. 97).—Case 1.—A boy, aged thirteen, whose hearing had always been good, developed slight deafness with loud noises of different kinds in the ear, and some vertigo. He was pale and thin and complained of dimness of sight. A tuning-fork placed on the vertex was heard normally, over the mastoid the duration of audibility was shortened. Low-pitched sounds were heard longer than high-pitched. The writer could hear a tuning-fork vibrating in the air for 23 seconds longer than the patient. There was no visible morbid change in the middle ear, nose or throat. The boy smoked 20-30 cigarettes a day. The writer diagnosed nicotine poisoning affecting the ears, and forbade tobacco. In 4 weeks the hearing was quite normal.

Recurrent Herpes Zoster: Zoster Erythematosus and Zoster Vegetans.—H. Vörner (Münch. med. Woch., Sept. 27, p. 1734).—A limited number of cases of recurrent or relapsing herpes zoster has been reported. There are several varieties. In one the eruption recurs in the same place and the same nerve area. In a second, different branches of the same nerve are affected during a relapse. In a third the relapse affects an area supplied by a different nerve from that originally involved. The first two varieties are much rarer than the third.

Case 1.—A boy suffered from an eruption of vesicles over an area of one external ear exactly corresponding to the distribution of the great auricular nerve. Before and during the eruption there was smarting and darting pain in the part. The vesicles usually became purulent and healed with the formation of tiny cicatrices. The eruption occurred thrice in 3 years. The great auricular nerve also supplies the skin in front of the ear over the parotid, but usually by a branch distinct from that which supplies the external ear.

In this case the herpes was vesicular, but the eruption may be nodular or papular, or consist of red, somewhat prominent patches, which may or may not become vesicular. If these patches are extensive they may resemble acute circumscribed erythema. Such red papules and patches may also occur in relapsing herpes.

Scarlatinal Infection.—R. E. Lauder (Lancet, 1904, Vol. i., p. 712) having arrived at the conclusion that "return cases" of scarlet fever are attributable not to the peeling condition, but mainly to undetected discharges from the respiratory passages and ears of those who have left the hospital, decided to institute a system of greater segregation and classification. Patients without complication after treatment in an "acute room" until the acute stage of the disease had passed, and a bacteriological examination had excluded diphtheria, were removed into a general ward where the recent cases were kept apart from those that were convalescent. Special blocks were reserved for the different complications into which a patient was removed on the supervention of such complication. At the end of the third week of the disease, if free from complications, the patients were transferred from the general ward to another pavilion after a careful process of disinfection. Here for one week the nose, ears, and throat were carefully douched with a disinfectant each evening after bathing, and the patient discharged no matter what the condition with regard to the peeling might be. Dr. Lauder states that by this means they have been almost completely freed from the occurrence of albuminia, enlarged glands, aural and nasal discharges, etc., and shows that the "return cases" have also been relatively fewer.

Ear Diseases following Acute Infections.—George E. Shambaugh (Medical Standard, Feb., 1905) says that the great frequency of ear disease in early childhood is a matter of common knowledge, and yet he believes it is quite safe to say that a large majority of cases of ear trouble at this age pass unrecognized. The types of ear diseases which occur with most frequency in early childhood differs widely from what is found in adult life. By far the most frequent form of ear trouble in young children is what is usually called the simple catarrhal otitis media—a mild disease running its course with slight symptoms and terminating in a few days or several weeks. The next most frequent type is the severer inflammation of the middle ear, the purulent otitis media. This is the only form that as a rule is recognized, and this often only when the discharge appears in the external meatus. The involvement of the labyrinth following the suppurative middl ear disease is not an uncommon occurrence. The primary involvement of the labyrinth in early childhood is unusual, but this is noted occasionally following mumps. I have seen but one such case, but a number have been reported in the literature. The condition comes on suddenly with symptoms of deafness, tinnitus and dizziness, just like the sudden involvement of the labyrinth which occurs in adult life, and results in complete destruction of the function of hearing in the ear involved.

There are several interesting questions in connection with the etiology of middle ear disease in early childhood. In the first place the great frequency of this trouble is attributed chiefly to two factors: The anatomical conditions are such that in early childhood infection is conveyed with greater ease through the tuba auditiva from the naso-pharynx into the cavum tympan. The second factor is that in early childhood occur with great frequency certain infectious fevers which, occurring at any age of life, are very prone to set up middle ear disease. Another point of interest in the etiology of these diseases is the question of how the infection reaches the cavum tympani. That there is a direct extension of the infection from the naso-pharynx along the tuba auditiva in many of the cases there can be little doubt, whether this is the only method of infection, or even the usual one, is a question which has not been settled. Bezold, in examining twelve temporal bones taken from children that had died from scarlet fever, found in all of them evidence of inflammation of the middle ear in varying degrees of severity, while in but a single preparation was there any evidence of involvement of the cartilaginous part of the tuba auditiva, and the conclusion was drawn that in scarlet fever the infection of the cavum tympani does not occur as a rule by extension along the tube, but that it was a result of hematogenous infection. Still another interesting question in the etiology of otitis media complicating the acute infectious fevers of childhood is whether the otitis media is caused by the specific germ which is producing the general infection. The evidence seems to show that at least in diphtheria the middle ear infection is only exceptionally produced by the specific germ of diphtheria, but is usually caused by a mixed infection. Those who have studied the scarlet fever infection from this point of view have usually found the otitis media resulting from a streptococcus invasion, which has been considered by some observers as identical with the specific germ causing the general scarlet fever infection. The situation seems to be that, while some of the cases of otitis media complicating the infectious fevers are the results of the invasion of the cavum tympani by the specific germ causing the general infection, it also frequently happens that the otitis media is caused by other pus producing micro-organism, particularly the streptococcus, staphylococcus and the pneumococcus.

The dangers from the middle ear diseases following the infectious fever of childhood come for the most part from the purulent type, yet the simple catarrhal form is not devoid of danger, for this may at any time change into the severe purulent form. Otologists recognize in the simple catarrhal otitis media the origin frequently of the dry chronic catarrhal otitis media, which in middle life causes a large proportion of the cases of severe incurable deafness. Purulent otitis media, complicating the acute infectious diseases of childhood, is a condition much more to be feared often than the original general infection. Every physician should be thoroughly awake to the seriousness of the condition and alert to detect its existence in its earliest stages, for much of the dangerous character of the disease can often be averted by proper treatment applied when the disease first manifests itself.

Scarlet fever, both in the frequency in which it involves the ear and the violence of the ear disease produced, stands in a class alone, far ahead of any of the other infections. It causes the most rapid and marked destruction of soft parts and bones of the ear, showing little tendency to heal, producing marked permanent disturbance of hearing, and having a high rate of mortality. The complications which are frequently seen in otitis media of scarlet fever origin are facial paralysis, rupture into the labyrinth, extensive destruction of the bones, especially in the region of the mastoid, involving frequently the lateral sinus.

The diagnosis of purulent otitis media is readily made by making a careful inspection of the membrana tympani. The failure to make the diagnosis is usually due to failure to suspect the possibility of the ear infection, and neglect in making the proper examination of the membrana tympani.

However typical and easily recognized the red and swollen membrana tympani usually is in cases of purulent otitis media, there are nevertheless cases where recognition of the condition is by no means an easy matter. This is especially true in younger children where the canal is often so small that, even with the smallest speculum, it is extremely difficult to get a satisfactory view of the membrane. In such cases it frequently happens that a pulsating light reflex seen in the depth of the canal gives the clue to the perforation of the membrane. In other cases it happens, particularly in scarlet fever, that a plug of desquamated epithelium completely stops up the bottom of the external canal, which, on examination, appears in the depth of the canal as a whitish area, and may be mistaken for the drum membrane itself. The removal of this plug not infrequently results in sufficient trauma to produce bleeding, which can readily be mistaken for a hemorrhagic discharge from the cavum tympani and so prevent the incision of the drum membrane so necessary in the early treatment of this condition in order to prevent serious complications.

In scarlet fever it frequently happens that acute necrosis of the temporal bone occurs with no complaint except headache, with no pronounced signs over the mastoid, and even in the absence of disease in the cavum tympani, the infection passing over this chamber entirely only to become active in the remotes cells of the mastoid process. One should examine the mastoid for the slightest change in color or the presence of tenderness on pressure, as these may point to serious bone disease even in the absence of involvement of the cavum tympani and in the presence of a normal membrana tympani.

Another fact in connection with the otitis media of scarlet fever that is often overlooked is that this may set in before the desquamation stage in the earlier days of the disease.

Next to scarlet fever, measles endangers the ear more than any of the infectious fevers of childhood. The usual type of trouble here is the simple otitis media. The severe reactions are more rare in measles than in scarlet fever, but when they do occur they sometimes appear to be fully as severe as the worst case of scarlet fever infection, producing rapid and extensive destruction of the membrana tympani, mastoid involvement, caries of the ossicle, destruction of the temporal bone and extension to labyrinth through necrosis of the capsule. The symptoms that should lead one to suspect an otitis media in young children are extreme restlessness, sudden high temperature, the occurrence of convulsions and symptoms of meningitis. Why symptoms of meningitis occur so frequently in children suffering from purulent otitis media is explained by the blood vessel communications existing between the middle ear chambers and the brain cavity in the region of the tegmen tympani et antri. These communications are largely obliterated as the bones assume their adult character. These very severe symptoms associated with the onset of otitis media disappear at once upon incision or spontaneous rupture of the membrana tympani.

Another fact of great importance is that otitis media in childhood, from whatever cause, may often take a very protracted course, running through many weeks without causing rupture of the drum membrane, yet producing at irregular intervals rise and fall of temperature until finally the rupture occurs. In these cases the membrana tympani lacks the red injected appearance typical of purulent otitis media, but appears as a lusterless yellowish membrane often obscured more or less from desquamated epithelium.

Cerebrospinal Fever.—J. C. Wilson, Philadelphia (Journ. A. M. A., April 29), reviews the history, causes, symptoms, treatment, etc., of epidemic cerebrospinal meningitis, a disease which has at present a special interest on account of the lately occurring epidemic in New England and New York. While it has been recognized for about a century, most of our knowledge of the disorder has been acquired of late years, and largely through the work of our countrymen, Councilman, Mallory and Wright. Councilman's recent paper (Journal A. M. A., Apr. 1, 1905) is referred to by Wilson. Formerly the communicability of cerebrospinal meningitis was doubted, but it is now admitted that if the nose, ears or lungs are affected, it may readily be conveyed from one person to another. Second attacks are very rare; it is probable that one attack confers a persistent immunity. The germs are found only in connection with the lesions of the disease, but mixed infections are not uncommon. The symptoms are most diverse, there are no prodomes and the period of incubation is unknown. In the malignant cases the symptoms of inflammatory lesions of the brain and cord and those of a general malignant infection are both overwhelming. The author goes at some length into the description of the general symptoms and those of the anomalous types, the fulminant form, the abortive, the intermittent and the chronic types. Few diseases vary more in their severity and mortality, or are followed by more complications. The diagnosis may be difficult, but if meningitis be present, it is not usually embarrassing during an epidemic. In doubtful cases lumbar puncture should be resorted to, and the presence of the meningococcus in the cerebrospinal fluid ascertained. The differential diagnosis between this form and tuberculous meningitis may, in some cases, be far from easy without this. The mortality of different epidemics varies between 20 and 75 per cent., the average is estimated by Wilson as near 40 per cent. In the mildest cases no treatment is required; in the malignant ones none is effective. Quiet, nutritious diet, cold applications to the head and spine, laxative doses of calomel in the beginning of the attack and opium are recommended, the last-named drug being regarded as indispensable. For prophylaxis, cleanliness and avoidance of overcrowding in times of epidemics, isolation and sterilization measures, and in case of successive attacks in the same family, abandonment of the dwelling and thorough disinfection are advised.

Value of Medicated Clay Poultices.—A. H. Roth, Ann Arbor, Mich. (Journ. A. M. A., Apr. 15), has investigated the claims and the action of a representative medicated clay poultice. These preparations, he states, are made up of a base of silicate of ammonia and magnesia, to which various aromatics and antiseptics are added, together with glycerin to make a pasty mass. It is claimed that their external application acts as a reflex vasomotor stimulant and promotes dialysis through the skin. As the preparations are non-irritating, the reflex action must be exercised through the heat produced by the warm application, and Roth finds from careful experiments that they are inferior in this regard to ordinary warm flaxseed poultices. Experiments on the living subject showed that the dialyzing power was no more effective in exciting perspiration than heated gauze pads. There was no evidence of any osmosis or endomosis, as was shown by experiments made with fresh human skin as a membrane through which no fluid passed until it had become water-logged, a condition which it is doubtful ever occurs in the living subject. Roth speaks especially against the practice of using these mixtures in open or septic wounds. Their value in acute rheumatism and pneumonia, is not greater than that of older and simpler methods and in pneumonia, especially in children, their weight embarrasses respiration, and the presence of the clay mixture interferes with the necessary physical examinations. Their use is a revival of the old poultice method, for which better substitutes have been found.

BOOK REVIEWS

International Clinics. Edited by A. O. J. Kelly, A.M., M.D., Philadelphia, U.S.A. Volumes III and IV, Fourteenth Series, 1904. J. B. Lippincott Company, Philadelphia, Pa.

In the issuance of these two volumes, much interesting and valuable material is placed, in convenient form, at the disposal of the profession. Syphilis is the leading topic of Volume III, and it is discussed exhaustively from a number of standpoints by eminent syphilographers.

Volume IV is more varied in its contents; expositions upon chronic polycythemia and treatment by radium being among the newer topics of interest. All of the contributions show careful preparation and are full of instructive thought.

Dr. Kelly has again demonstrated his ability, through the wise selection of theses, to keep the International Clinics upon heir wonted high plane of scientific usefulness.

INTESTINAL CATARRH

J. Griffin, M.D., Shreveport, La., states: It would be gratifying to myself to say something on the subject of Glyco-Thymoline, a remedy of some years' standing, but in some measures new to me.

After it was brought to my notice the first use I put it to was in a case of intestinal catarrh, following an attack of measles. The patient was a young man about thirty years of age. Prior to the case falling into my hands lavage had been tried with him but it seems he grew worse instead of better. He had also been put upon the use of some of the empyemas with no better results. He presented himself to me as an anemic scarcely able to partake of any kind of food without suffering gastric pain with other gastric disturbances, accompanied with eructations of gas. He had been endeavoring to diet himself but was steadily growing worse.

Here was a case I thought for the administration of one of the preparations of papayata carica, and procuring one of its forms it was faithfully taken, accompanied with a careful dietetic regimen. But every dose seemed to give him pain in the epigastrium so that he was compelled to abandon its use. I determined ther to try what Glyco-Thymoline would do and accordingly I put hir on the following:

Glyco-Thymoline ....oz. j
Boiled water qs. ad............oz. vj

M. Dose, one teaspoonful an hour before each meal and at be time in a little water. I required him to constantly drink all th hot water he could digest and to take it no other way.

He was situated at a mill where boiling water was at all time accessible so that quite early in the morning he would drink fro one to two and sometimes three tumblers of hot water at one tim followed by a dose of the medicine. Of course he was diete restraining himself in all the food which he found would disagre with him. He was not permitted under any circumstances to u meat of any kind. He was allowed to drink sweet or buttermi at every meal. He would ring the changes upon the cereals, usir grape-nuts, oatmeal, rice, etc. The progress was at first slo The decrease in the amount of gas belched was noticed first and b degrees the pain which had always come on just after eating gre less and he began to take on flesh. Whenever his bottle of mec cine was exhausted it was at once refilled and the improveme was marked. After six weeks' time circumstances prevented r from seeing the patient any more but I had assurance that his r covery was only a question of time. I had decided to accompa this treatment with small doses of sulpho-carbolate of sodium b was prevented from doing so.

M. J. Silverman, M.D., New York City, states: I want to t you that Glyco-Thymoline is all right. Just recently I gave i

PEDIATRICS

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ORIGINAL ARTICLES

THE TREATMENT OF SCALP RINGWORM—SOME GENERAL RULES OF PROCEDURE.*

By T. Colcott Fox, M.B., F.R.C.P.,

OF LONDON,

PHYSICIAN FOR DISEASES OF THE SKIN TO THE WESTMINSTER HOSPITAL, AND VISITING DERMATOLOGIST TO THE RINGWORM SCHOOLS OF THE METROPOLITAN ASYLUMS BOARD.

1. *Examination.*—At the first inspection attention should be directed to the existence of any patches on the smooth skin, to possible implication of the nails—a rare complication in this country—and particularly to the distribution of the disease in the scalp. The child should be placed in a good light, and the hairs of the scalp turned over against their set in different parts by the blade of a pair of forceps, or the deft use of the fingers. A practitioner must be hopelessly at sea if he is unable to recognize with the eye not only the diseased stumps of obvious patches of disease, but also those occurring in less significant areas, and even isolated. In most of the cases first seen by me the classical symptoms have been altered by treatment, and the one unfailing resource is the recognition of diseased stumps.

2. *Cutting Hair in Preparation for Treatment.*—The extent to which this is carried out must depend on the distribution and extent of the ringworm present, and the age, circumstances and surroundings of the patient. Removal of the hair over he whole head is most satisfactory for treatment and for observation, and for the prevention of auto-inoculation. The scalp can be shaved under antiseptic conditions, but I prefer to

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* Practitioner, April, 1905.

keep the hair clipped to the length of about half an inch, so as to command a survey of the whole scalp, yet allow a distinction to be drawn between healthy and diseased hairs, and facilitate cleanliness and general preventive treatment.

3. *Marking Out Diseased Areas.*—Mark out the diseased areas, taking special care to locate any tiny commencing spots, by painting with an iodine solution or an aniline pencil. These areas must never be lost sight of again, as so frequently results from washing, etc., or little commencing patches make headway and single stumps remain uncured about the head. In France it has been customary to epilate a zone of healthy hairs around all diseased areas, big and little, but this proceeding is irksome in many cases and unnecessary.

4. *Head Covering, Toilet Articles, etc.*—A suitable inexpensive head covering should be worn day and night, made of linen or other cool material. Grocer's waxed paper is apt to be heating. It is needless to add that toilet articles used should be rigorously kept apart from other children and kept disinfected.

5. *Washing the Head.*—Subject to an occasional necessary clean-up, the less the head is washed the better. Washing does not aid the cure, and I believe it may cause dissemination of the ringworm and of coccogenic pustular infection of the follicles in certain cases.

6. *Prevention of Auto-inoculation.*—It is advisable to apply to the healthy surface some innocuous and unirritating parasiticide, such as carbolized vaseline or glycerine. Sabourand advocates the use of tincture of iodine diluted with three volumes of 90 per cent. alcohol or eau de cologne as the application of choice. The latter preparation, he says, also helps to disclose diseased areas not hitherto noticed. If diluted with four volumes of spirit, it can be applied four times weekly. Iodism is rare, but in certain sensitive children the application may cause restlessness and dreaming, and then a less penetrative application of one grain of iodine and of iodide of potassium in the ounce of water may be substituted. Long-continued applications of iodine and other chemicals, like incessant washing with strong soaps, are apt to excite an obstinate epidemic desquamation. When once the diseased areas are under efficient treatment it is remarkable how seldom auto-inoculation occurs.

THE CHOICE OF A METHOD AND REMEDIES.

Parasciticide Treatment.—The first point to clearly understand is that there is no lack of substances which have the power of killing the parasitic moulds which cause ringworm. On the glabrous skin we know that, with the exception of certain chronic tropical ringworms of the inguinal region and palms and soles, the disease is readily curable (1) because the parasiticide can easily reach the fungus lying in the superficial epidermic layers or small hairs, and (2) because the parasiticide, being usually an irritant, helps mechanically to remove the fungus by promoting desquamation. But experience teaches us that it is practically impossible where strong hair growth exists to make the remedy penetrate sufficiently deeply into the follicle, and likewise, through the hair cuticle, into the diseased hair.

To surmount this fundamental difficulty various methods have been devised, such as (1) the removal of all natural oil preliminary to the application of the parasiticide; (2) the incorporation of the parasciticide with substances—such as ether, chloroform, turpentine, petroleum, glycerine, vaseline, lanoline, etc.—which promise to facilitate the penetration of the remedy; (3) the continuous application of the parasciticide under an impermeable head covering; (4) the forcing in of the parasciticide by a special vacuum-producing apparatus (Abraham); (5) by a special electrical process known as cataphoresis. By none of these methods can we ensure success, and we have to realize the fact that, although many agents are capable of killing the fungi, we are unable, as a rule, to make them penetrate into the depths of the follicle and to soak into the hair with sufficient thoroughness to come to close quarters with the parasite. Only in certain young children with hair implanted comparatively superficially, or in whom the fungus does not find a very congenial soil, is it possible to effect a cure with a purely parasiticide application, and even then it is possible that the cure is effected by detachment of the diseased hair.

In this connection I will mention two ointments. I have tried equal parts of Ung. Acid Salicylici and Ung. Sulphuris in hundreds of cases with most unsatisfactory results. Similarly, I have used with almost as great a disappointment an ointment composed of Sublimated Sulphur ʒj, Ung. Hydrarg. Nitratis ℥ij, Olive Oil, Phenol and White Wax, of each ℥j. Examples of very similar preparations could be multiplied *ad infinitum.*

Treatment by Epilation and Depilation.—If we cannot destroy the fungus *in situ,* can we remove the diseased hairs bag and baggage? A temporary cessation of growth with fall of the hair has exceptionally resulted from the continuous application of a saturated solution of boric acid in methylated spirit and ether, and from the use of gas water (Aldersmith). Such happy effects, however, cannot be relied on. Then the simple plan suggests itself of carefully pulling out (epilating) all the diseased hairs, which is satisfactory with the less fragile hair of favus infection. Various plans have been in vogue, from the barbarous old wholesale method of the calotte to the modern detailed plan by forceps. In most cases and most stages of ringworm, however, the extreme fragility of the diseased hair makes this treatment futile, for the hairs break and grow again as diseased as before. Nevertheless, I wish to insist here that epilation sometimes proves an invaluable aid to cure. When the hairs become loosened in the course of treatment they can sometimes be readily and painlessly extracted entire, often with the root-sheath adhering. I always try this proceeding from time to time. It requires a practised hand, and demands the time and patience which so many practitioners grudge. It is common practice to forcibly remove a dried crust and so bring away the diseased stumps, but a large proportion are almost always broken off.

Epilation after Croton-Oil Needling.—An invaluable method of epilation, which I learned from Aldersmith years ago, consists in croton-oil needling, called in Paris "l'épinglage." Aldersmith uses a special needle; Sabouraud a watchmaker's needl of hard steel and quadrangular section, known as an "alésoir" I use a triangular glover's needle. The latter is lightly coate with a film of croton oil and gently insinuated deeply into the diseased follicle, care being taken not to pierce the skin. This operation loosens the diseased hair, which can then be frequently extracted entire with the adherent root-sheath by gentle tractio If the fragile stump breaks it will be presently shed by the formation of a pustular perifolliculitis. This method has a wide fie of application towards the terminal stages of a treatment whe a few scattered stumps remain, in cases where isolated stum occur, and in the disseminated "black dot" cases. It will obvious that the ability to recognize diseased stumps is essential. This needling is infinitely preferable to destroying the hair papilla by electrolysis or the cautery.

Depilation by X-Rays.—This is a method of depilation which must revolutionize the treatment of ringworm. Experimenters iave been somewhat timorous with this method. Two or three years ago Dr. Mills effected an excellent cure for me of an extensive scalp favus at the Westminster Hospital, and of late I iave been sending all my cases to the Light Department, where Dr. Sale-Barker has been uniformly successful without any misiap. By a suitable dosage and selection of the rays, which can iow be regulated, and their concentration on a diseased area the iairs can be made to fall without serious damage to the scalp, nd they are replaced after an interval of some weeks by a healthy iew growth. From every point of view this must become the reatment for the future wherever the rays are obtainable. It s painless, and comparatively rapid and economical. All danger f infection to others is rapidly removed, and the only drawback s a somewhat prolonged period of more or less baldness. In the Iunicipal Ringworm Schools of Paris this method has now been efinitely established by Sabouraud.

Depilation by Inflammatory Treatment.—What else can we o where the X-rays are not available? Experience teaches us iat our end can be obtained by setting up a requisite grade of iflammation, and we may learn our lesson by the study of the elf-cure of the highly inflammatory phase of ringworm known inically as *Kerion.*

It is of the greatest practical importance to acquire a clear onception of the kind and degree of inflammation required to fect our purpose. A too superficial inflammation, such as ie eczematous or that caused by a blister, is useless for removg the hair. On the other hand, it must not be too deep, or the ermis and hair papillæ may be permanently injured. It must ot be too acute and intense, or an abscess may result and scarng. We require a quiet inflammation just deep enough to use a gradual detachment of the diseased hairs. The ideal is to nit the process to the immediate neighborhood of the hair folles (perifolliculitis), and it is luckily the case that the diseased llicles sometimes tend to inflame more readily than healthy ones.

The next practical point to bear in mind is that no two children's scalps react quite alike to the same irritant. Thus ta products are known to be apt to set up a perifolliculitis, and I effected a brilliant cure of a girl by setting up an inflammatio limited to the diseased follicles by rubbing in a liquid pitch soa (Liquid Pitch 3 parts, Soft Soap 1 part). The patient's siste would not react. A precisely parallel occurrence was witnesse in two sisters, where I used Balmanno Squire's Saturated Solutio of Sulphurated Potash in Glycerine (equal parts). A stron verdigris liniment is apt to cause some necrosis about the follicle As a rule, the ideal limitation of the inflammation to the follicl cannot be secured, and the intervening skin is involved.

There are certain drawbacks to this inflammatory method. causes discomfort, if not pain. It is unsightly and even alarn ing to parents, and consequently in private practice, unless tl practitioner has a strong influence, this method becomes som times almost impracticable. Another drawback is the occasion irritation of related lymph glands. It is obvious that the meth exacts a right conception of what is needed, and that the pra titioner must take infinite pains to direct the details or disast will follow. I have superintended this treatment in hundre of cases, and am in a position to say that where carefully and i telligently carried out the method is most successful.

The choice of an inflammatory remedy must depend in sor measure on the age of the child, the disposition and sensitivene to discomfort and pain, the susceptibility to reaction, the size a number of the infected areas and the urgency of a rapid cu Certain agents, such as strong iodine, formaline and glacial ace acid, cause considerable pain.

The medium in which the agent is applied, whether as pigment, crayon or ointment, may also be varied. Pigments, example, have the advantage that their action can be localized the diseased areas, whilst ointments are apt to spread more less over adjacent parts.

Keeping steadily in view the effect aimed at, it is wise proceed carefully until the susceptibility of the child is ascertain We can gradually increase the strength of the application u the proper effect is produced.

I will now mention some of the treatments I have thoroug tried.

Coster's Iodine and Tar Pigment is very useful. My criti-c ns on it are that it is too strong for some vulnerable children, a l that ulceration and scarring may take place under the adher-er black crust. Similar well-known pigments are those sug-g ted by Toulmin Smith and Morrant Baker and Illingworth (ydrarg. Iodid. Rubr. gr. iv-xv., Sol. Sodii Iodid. (1 in 4) q.s., S Chlorof. ʒij-ʒiv; Aq. ad ℥).

Sheffield's Treatment.—Apply to the entire scalp, and more th kly to diseased patches—by means of a painter's brush—once a ly for five successive days the following preparation: ℞ Acid. C bolici, Olei Petrolei aa 65.0; Tinct. Iodi Ol Ricini, aa 100.0; O Rusci (German) q.s. ad. 500.0. On the sixth day wipe off w h the rag dipped in plain oil, clip the hair again, wash thor-o hly with green soap and soft nail-brush, remove all scales ar loose hair. On the seventh day reapply as before. When th new hair grows apply for a few days 10 per cent. sulphur oi ment, and finally for two weeks ℞ resorcin, Acid. Salicylici aa 6.0; Alcoholis, 120.0; Olei Ricini ad 500.0. Sheffield claimed m vellous results, which it has not fallen to my lot to confirm. T application is dirty.

Frazer's Izal Treatment.—(1) Wash the scalp thoroughly with so soap to which 5 per cent. carbolic acid has been added, and th oughly rinse away. (2) Take a pledget of absorbent wool di ed in Waugh's purified benzine (turpentine is too irritating) ar thoroughly cleanse the patches from grease. (3) Rub in co mercial Izal oil to each patch with a stiff, short-bristled brush, pr enting the oil running on to healthy skin; stop the rubbing wh n frothiness is manifested; dry the patch with wool or blot-tir -paper. (4) Repeat 1, 2, 3 every third day for each separate pa h. My friend, Dr. Frazer, of Romford, kindly recommended th treatment to me some years ago. It is decidedly useful in cer-tai children who react easily, but has often failed in my hands.

Foulis' Treatment.—(1) Rub in spirits of turpentine to the pa hes for several minutes, until it hurts. (2) Then rub with 10 er cent. carbolic soap, and then warm water to make a lather. (3 Dry with a towel, and apply two or three coats of Tinct. Io-di to the patches. (4) When dry rub carbolized oil (1 in 20) ov the head. This treatment is to be carried out night and mo ning. Dr. James Foulis also claimed surprising results, but th treatment has disappointed me.

These treatments fail to cope effectually with any single is lated stumps that may exist.

Chrysarobin Treatment is undoubtedly useful, and it can l applied in any strength adapted to excite the requisite inflamm tion in the particular child. I need not refer to the various met ods of application such as are used also in psoriasis. Chrysar bin has many disadvantages. It is dirty and staining, and apt get on the face and other parts and set up an inflammation.

Formalin Treatment has greatly disappointed me. It is pai ful, it tends to set up an eczematous type of inflammation whi is useless, and its action must be very carefully confined to defin patches.

Of ointments which set up a desirable grade of inflammati without pus formation, the two I consider the best are the f lowing:

Ung. Cupri Oleatis.
℞ Cupris Oleatis .... ʒ j-ʒ v.
Olei Amygdal. .... ʒ ij-iij.
Adipem Lanæ Hydrosum ad .... ℥ j.
M. Ft. Ung.

(If oleic acid be used in its composition, a more irritating eff is produced. Chrysarobin gr. xx. may be added.)

Ung. Hydrarg. Oleatis (Aldersmith).
℞ Hydrarg. Oleatis Absoluti (Corbyn) .... ʒ ij-ʒ ij ss.
Adipas Lanæ .... ʒ j ss-ʒ ij.
Acid. Oleici ad...................... ℥ j.
M. Ft. Ung.

These ointments can be progressively increased in streng and more and more vigorously and frequently applied until desired effect is produced. They are, however, far from be thoroughly reliable. Crusts must not be allowed to form.

Lastly, I come to two treatments which are accompanied the formation of pus. Pus was at one time held by some be inimical to the fungus, but this is not the case, and pus forr tion is a decided drawback and it is apt to set up impetigo boils about the head and to form crusts.

Salt Treatment.—Salt has been used in saturated solution generally in ointment form with vaseline. In the latter fo equal parts may be used, or stronger. Its effects are vari and somewhat uncertain, but in many children it excites a pust rmatitis which is very effective, and the places recover more ickly than after croton oil.

Croton-Oil Treatment.—Croton oil is painless except on tches already inflamed. After a very wide experience, I hold t this treatment is the most certain and effective we have, but, e all potent agencies, it requires most careful control and cant be left to inexperienced hands. It is a notable fact that it is treatment favored by Aldersmith, by Sabouraud in the Ecole llier, and by myself in the Ringworm Schools of the Metroitan Asylums Board. There are some variations in the way treatment is carried out.

Aldersmith, after ascertaining the susceptibility of the child treating one patch, gives the following directions: (1) Rub a patch one drop of croton oil, and prevent the spreading the oil to healthy parts by using a small quantity, and protecting the healthy skin around by smearing on carbolized lanolin (in 8). (2) After four hours apply to the patch a soft ,sticky, small linseed poultice, and over it a piece of oiled silk. The poulti must be fixed, for if it shifts it may disseminate the croton o (3) Next morning bathe the patch and cleanse away all p, and reapply the croton oil and the poultice as before. (4) T subsequent treatment will depend on the state of the patch. I ny case, the inflamed surface must be kept clean and free from al pus. If the requisite degree of inflammation is not set up, re at the course. When the desired effect is produced simply ba e and continuously poultice, keeping up the inflammation until al diseased stumps have fallen, or been extracted unbroken. Coca e applications can be made before epilation. Boric acid fomenta ns retard pus formation when the patch is properly inflamed.

Sabouraud, with his large field of observation at the Ecole ler of the Hôpital St. Louis, became convinced that the croto oil treatment was the best and nearly infallible, although at on time discarded in Paris. He formerly used a crayon made wi cacao butter and wax, or in certain cases a mixture of equal pa of sweet almond and croton oils. He directs that after testing the susceptibility of the child: (1) A drop of croton oil is rul ed into the patch and all excess wiped away. (2) If the inflai natory reaction is severe and vesico-pustules form, equal parts of icture of iodine and 90 per cent. alcohol are applied next day to tigate the inflammation and dry up the pustules. (3) After

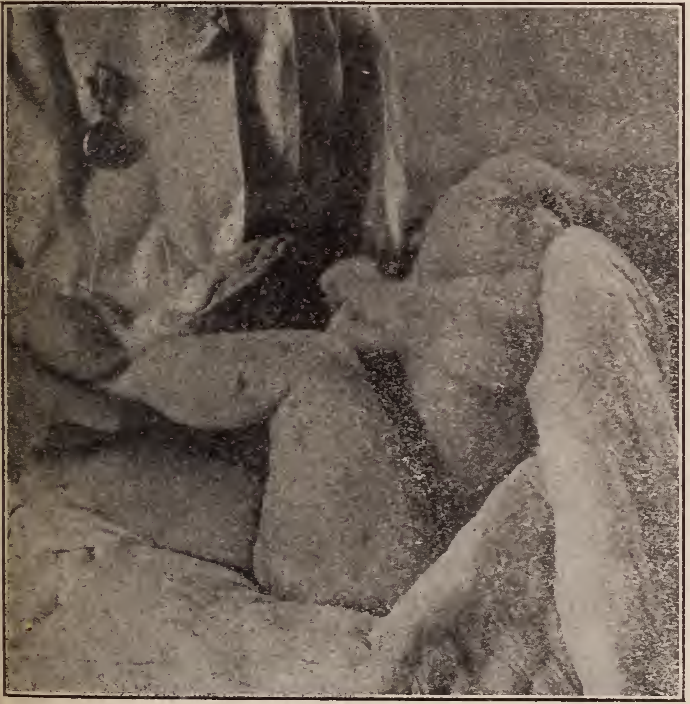
three days the crusts are removed by a moist dressing, or sca
may result. Thick crusting must always be prevented. (4) Tl
croton oil should only be applied every 12 to 15 days, and aft
four or five applications at least two-thirds of the diseased hai
will have gone. After that croton oil applications are less sati
factory. (5) Epilation of the stumps in their entirety is an i
valuable adjunct.

This treatment, which I learned from Aldersmith, I have us
for many years. I apply an ointment containing ʒ j of croton
to the ℥ j of base, and this is rubbed in daily, or as often as ne
essary to excite the desired degree of inflammation. Such a st
is then maintained by judicious reapplication until all the diseas
stumps have fallen or been epilated. All pus formation is rig
ously cleansed away, and crust formation is not allowed. Th
is no method comparable to croton-oil needling for residual a
isolated stumps.

ASE OF PURPURA HEMORRHAGIA OF INTESTINAL ORIGIN WITH SYMPTOMS OF MENINGEAL IRRITATION.[1]

By Robert A. Black, M.D., of Chicago.

Case I. Baby G., age twelve months. The baby was never sk before the present attack. Was nursed exclusively at the east till six weeks ago, when it was placed on a modified



rk diet. The mother says the child was always very nervous. The mother had a miscarriage at six months following a stin. The father is subject to attacks of epistaxis.

The present trouble began April 18. For two days previo the baby had been slightly constipated. On the day of the atck the mother gave the baby 3 ℥ of oatmeal water. About o and a half hours after the baby was suddenly seized with vomiting. The mother at once gave the baby 1-10 gr. doses of calomel.

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[1] Read at Chicago Pediatric Society, May, 1905.

I was called to see the baby at 8 o'clock the following morning. The child had rested practically none during the night, had vomited about every hour. The vomiting was still continuing, and consisted of clear sour smelling seromucous fluid. The child was very restless, suffering with colicky pains. The abdomen was slightly distended with gas. There had been one bowel movement which the mother said was firm, yellow, and without much odor.

A few purpuric spots were noticed. These were mostly confined to the feet, ankles and posterior part of the thighs and buttocks, mostly small, about ¼ to ½ a centimeter in diameter but over the outer side of the right knee were two larger ones which later underwent a dry necrosis.

Inspection of the mouth showed purpuric spots on the hard palate and a few on the pharynx. The tonsils and gums were negative. Chest negative. No glandular enlargement. Temperature 102 degrees; pulse 20; respiration 40.

On giving the baby a colonic flushing I secured a copious bowel movement which was mixed with mucus, foul and yellow greenish in color, with some white flakes, also the expulsion of some flatus.

At five the same day I again called and found the trouble still progressing. The purpuric spots were increasing, a few being now noticed about the wrists. The abdomen was still distended with gas. The baby uttered a continual sharp whining cry, the hands were clenched, and there were small twitchings confined mostly to the upper extremities. There was a strong tendency to retraction of the neck, but the neck was easiy flexed. There was also an indefinite Kernig's sign. Temperature 103.2; pulse 130; respiration 60 and very irregular.

I asked for Dr. J. C. Cook in consultation and saw the bab with him at 11 o'clock that evening, when he found the following condition:

The vomiting still persisted, there was retraction of th neck, a tendency to opisthotonos, rigidity, a continual twitching which had now become general. Some tenderness along the spine, Kernig's sign. The child refused utterly to be in an position except on its back, flopping back from the face positio in a rigid manner.

Temperature 102.4; pulse 140; respiration 70 and of an a typical Cheyne Stokes character. Blood count and culture negative; urine negative.

The following treatment was then started: Irrigation of colon with 2 quarts of normal salt sol. qid. Ice cap to head. Quiet, semi-darkness, etc. Hg. Chor. mit. gr. 1-10 every 3 hours. Albumin water.

The vomiting then gradually ceased. The pulse and respiration improved. The temperature continuing about the same. On the fourth day Panopepton, whey and Liq. Pep. were added to the diet. The baby then showed marked improvement, gained steadily, the former signs of meningeal irritation disappeared. The temperature, however, stayed up, running a steady course of 102 to 104.

Improvement continued up to the 9th day of the disease at which time the child was apparently assimulating about 20 oz. per day of whey, albumin water and oatmeal water.

On the morning of the 9th day purpuric spots appeared over the face which in the former attack had been free. In the afternoon it began to refuse its food, and fret a great deal. On the morning of the 10th had two convulsions. I saw it again with Dr. Cook that morning and the following condition was found: The pupils responded very sluggishly to light and also contracted. Kernig's sign was again present, rigidity, Babinski, tache cerebrale. The respiration had dropped from 50 to 26. Pulse still rapid, and irregular 150; temperature 103.8. At noon the baby again had two convulsions which were controlled by hot packs. At 2.45 the child again went into convulsion and died at 4.45 in convulsion.

Purpura occurs as a symptom under many conditions; it also occurs in a certain clinical picture to such an extent, that it almost assumes the dignity of a disease on its account. For this reason it is customary to classify purpura under two main headings:

I. Symptomatic. II. Essential Purpura.

It is the intention of this paper to discuss the essential type although a brief notice of the symptomatic will be taken.

According to Osler, all cases of symptomatic can be classified under the following headings.

(a) Infective diseases. Occurring in these diseases, it usually shows a virulent type of infection, and is much dreaded as a symptom.

(b) Toxic. Being produced by a great variety of drugs, kali iodide and copaiba being the most common; venom of snakes, insects and other poisonous animals.

(c) Cachectic. Some of the chronic diseases are accompanied with purpura particularly during the last stages. Of these cancer, and chronic anemias probably lead.

(d) Nervous disease. The purpuric spots after the lightning pain of tabes and the bleeding points of hysteria, are two good examples.

(e) Mechanical, as occurs in whooping cough and venous stasis however produced.

The second type, which for want of a more definite explanatory term, is called essential purpura, we find divided by various writers into four clinical types.

(a) Purpura simplex, in which the eruption is confined to the skin and the constitutional symptoms are slight.

(b) Purpura rheumatica, in which constitutional symptoms are more severe, and are accompanied by pain and swelling of the joints.

(c) Purpura hemorrhagia in which there are hemorrhage into or from the skin, mucous, or serous membranes, accompanied by gastro-intestinal symptoms.

(d) Henoch's purpura, characterized by the tendency to relapse, symptoms of joint and gastro-intestinal involvement.

Essential purpura occurs most often in childhood: the greater number of cases occurring between the ages of 2 and 12 years, although cases are reported in infants at the age of four months and it is not uncommon for young seemingly healthy adults to be attacked.

The female is slightly more frequently afflicted than the male.

The family history gives little data of value in arriving at an etiological diagnosis. The children of hemophiliac parents, as would be expected, are more frequently attacked. In many cases the only hemophiliac history is of parental epistaxis. A neurotic history is often found. Specific and tuberculous diseases in the family history act as a predisposing cause by lowering the vitality and rendering it more liable to any disease. Many of the children affected are in a condition of lowered vitality at the time of the attack.

The environment furnishes a like predisposing cause. Poor food, deficient in quality and quantity is also noted, although the food and environment do not hold as prominent a place as in scurvy.

A relation between purpura and rheumatism is claimed by many, being assumed mainly on our knowledge that the rheumatic toxin has a special affinity for the serous membranes and the joint involvement.

I think we can hardly give the rheumatic microorganism a very prominent place in the etiology. In the vast majority of purpura (essential) cases the gastro-intestinal symptoms stand out noticeably, whereas with rheumatism the gastro-intestinal symptoms are merely of the febrile type.

Rheumatism is a disease usually running its course in about six weeks, and judging from purpura occurring in other disease we should expect it to be of still longer duration when accompanied by purpura. Purpura, however, usually abates in 10 days or 3 weeks, although the anemia produced may last longer. Purpura lacks the frequency of heart complication.

Again in rheumatism there is a marked leucocytosis whereas the blood finding in purpura usually resemble a hemophilia or scurvy. The joint symptom can be accounted for by the hemorrhages, and a toxin that exerts such a marked influence on endothelium lining of blood vessels surely can equally easily affect the serous membranes of the joints.

Hemophilia and scurvy both produce joint symptoms and yet we do not associate them with rheumatic microorganism.

As for a specific microorganism none as yet have been found definitely.

Gimard, Hanot, Letzerick, and Kolb have all done experimental work and several different microorganisms have been found. Most of the cases investigated have been of a grave malignant type. All the above mentioned have succeeded in isolating bacteria in pure culture which would produce purpura with intestinal symptoms in dogs. Their work, however, has been far from conclusive and lacks confirmation and further investigation.

There are clinical facts in favor of purpura being a toxin which is a vasomotor poison, and is produced in the intestinal canal either by some of the intestinal flora or by autointoxication. Among these facts first is noted that there is the lack of incubation period in many cases, the onset being usually sudden, with but few prodromal symptoms which we find so commonly in acute infectious diseases.

2nd. The gastro-intestinal involvement in practically all cases, consisting of vomiting, diarrhea, colicky pain, and putrefactive changes in the intestinal canal.

In the case just reported the grandmother, mother and father are all subject to urticaria, which usually follows dietetic errors.

3. The intimate relation of erythema multiforme and urticaria, urticaria pigmentosa being almost on the border line. These two diseases are both accredited with being caused by an autointoxication, the poison being vasomotor in toxicity.

4. The blood changes are not the changes of an infection, the blood of purpura and scurvy, according to Cabot and others, being practically the same. Other writers mention a leucocytosis which is very inconstant.

5. The cases of purpura hemorrhagia which run a chronic course of weeks, months or years are with difficulty diagnosed from scurvy.

For these reasons, although we can not exclude an infection yet it would seem to be an autointoxication from the intestinal tract in the majority of cases.

In summing up the etiology Johnson and Steelwagon give it under 3 headings, Vasomotor, Toxic and Infection, which apparently will include practically all cases of essential purpura.

The most constant pathological findings are circumscribed areas of blood extravasation, usually in the papillary layer of the derma. Why it is that the blood vessels will not hold their contents is a mooted question. There have been described by some writers changes in the small blood vessel, consisting usually of an endarteritis, occasionally a complete rupture.

It is not necessary, however, to have a diseased condition of the vessel itself for we know that diseased blood can pass through a normal vessel wall.

Henoch suggests the vasomotor origin, in which there is a paralytic distension of the capillaries, produced by the toxin, followed by stasis, hemorrhage or edema.

In some cases it would seem that the lesion is produced by minute emboli blocking the vessel, e.g., malignant endocarditis.

The blood shows no pathognomic changes. There is a slowing or a complete lack of coagulation. The blood platelets are reduced in number and increased in volume. The greatest change, however, is shown in a lessening or a complete loss of their characteristic grouping. There is also a reduction of the red cells, depending on the extent and duration of the hemorrhages. In severe cases megaloblasts and microblasts appear and even an occasional myelocyte.

According to charts by Osler the leucocytes are also correspondingly diminished although at the onset there may be a mild leucocytosis of 10,000 to 12,000. This rapidly passes away and the reduction then corresponds to the amount in the red cells.

Certain pathological changes also occur as the result of the hemorrhage into the mucous, or serous membranes and vital organs. Intracranial hemorrhages are rare, and when present usually occur into the meningeal coverings.

Ecchymoses are sometimes found beneath the pericardium but the varieties of endo and pericarditis are noted by Holt.

The spleen is rarely enlarged and when found so the condition s usually due to the occurrence of hemorrhages into the substance of the gland. The kidney is the most frequently affected of all the organs, probably on account of its function, along with the skin, as the excretory organ. Blood is found in the urine and a mild type of acute degeneration is often present, although se-vere nephritis is very rare.

Hemorrhages into the peritoneal cavity may occur, and a bloody serous fluid be found. The same may happen to the in- estines producing bloody stools and diarrhea.

Gangrene may occur in the skin or mucous membrane. Os- er refers to two cases of gangrene of the uvula. Holt men- ions the report of a case showing gangrene of the prepuce. he case I have just reported showed gangrene in two large urpuric spots over the external condyle of the femur.

The symptoms of a disease so multiple in type are also ubject to variations. In the mild form there suddenly appear urpuric spots, usually on the dependant parts of the body. here may be a few indefinite symptoms for a day or two previ- us, usually pointing to the digestive tract. Later at the time of the eruption there is frequently vomiting, diarrhea, typanites, coated tongue, etc. Fever may or may not be present. There may be a few vague aches about the joints.

The hemorrhages first appear as small petechiæ varying from a pinhead to a pea size. Later they may become much larger by coalescing or by enlarging from the periphery. They are bright red in color, becoming purplish and later various shades of purple or green. They do not disappear on pressure and gradually fade away in 2 to 4 weeks.

In the severe form where hemorrhages occur from the mucous membrane the onset is usually still more sudden. Purpuric spots suddenly appear varying from a pea size to that of the hand. There may be bleeding from the gums and nose. Nausea, and vomiting appear. The vomited matter may contain blood. There are abdominal pains frequently accompanied by diarrhea, pains and swelling of the joints. The hemorrhages may then take place in any organ of the body, blood appearing in the urine, the liver and spleen enlarging, or as in the case reported the hemorrhages may occur in the brain, producing symptoms of a meningitis, or by still larger hemorrhages the symptoms of a brain tumor.

Corbett, in the hand reference book, speaks of a purpura hemorrhagica which is chronic, lasting months and resembling very much scurvy in the symptoms. The other authors I have investigated do not speak of such a chronic course.

Another form, the purpura rheumatica, or Schönlein disease, is characterized by the same purpura with a multiple arthritis. It is frequently associated with urticaria and erythema multiforme. The temperature ranges a little higher, otherwise the symptoms are much the same only aggravated. Frequently there is edema of the face and eyelids, and a tendency to sore throat.

Henoch's purpura is briefly symptomatized by several authors as a variety seen oftenest in children and characterized by relapses, cutaneous symptoms resembling an erythema a much as purpura, pain, vomiting and diarrhea, joint involvement, and hemorrhages from mucous membranes.

For the diagnosis, many things will be required to b thought of, depending a great deal on the location of the purpura.

Among these are any of the malignant fevers. Here there is usually the prodrome of each disease, and a much higher temperature. The blood examination also may be of some value, but in such malignant infections it is common not to get a marked leucocytosis. Dietetic errors may be found.

Scurvy also sometimes causes difficulty but here the sanitary conditions are noted, the gross dietetic errors, the soft spongy gums, which bleed easily, the hemorrhages which are usually deep and more intermuscular than interdermal.

Meningitis also may, as in this case, come up for discussion, and it was noted that the purpura preceded all meningeal symptoms, the blood was negative. Later there was rapid abatement of meningeal symptoms which recurred one day after a second outbreak of purpura.

Erythema nodosum and syphilis in rare cases may be confusing. The prognosis should be guarded in even the milder types as there is no definite way of positively telling where the purpura hemorrhage will occur. It is usually a sign of grave import even in the mildest cases, although recoveries in them are often noted in two weeks or ten days. The severe forms are frequently subject to relapses and usually last about one month. The treatment is subject to much discussion and as is usual in cases in which no specific is noted, there are a multitude of remedies. If the symptoms point to toxemia as the cause, then our efforts should be directed to the cleansing of the alimentary canal, and afterward to prevent fermentaion. For this calomel excels all others. Salicylates are used by many and may also be of advantage as anti-ferments. Hemostatics also are employed. Ergotin, chloride of iron, aromatic H_2SO_4, suprarenalin, have all been recommended.

The general care of the patient is more important than rugs, and the first consideration should be to put the patient t rest in the horizontal position. Many cases are reported where the purpura has increased on the patient assuming the rect posture. In some cames where the lower extremities nly are affected, absolute rest, light, easily digested diet and he occasional use of stimulants, may be all that is required.

SOME ASPECTS OF INFANT FEEDING

By Wallis D. Walker, M.D., Portsmouth, N. H.

As a beginning for this paper, I think I cannot do better than to quote verbatim the paragraph with which Dr. Emmett Holt opens his chapter on "Nutrition:" "Nutrition in its broadest sense," says Dr. Holt, "is the most important branch of pediatrics. At no time of life does prophylaxis give such results as in infancy, and no part of prophylaxis is worthy of more attention than the conditions of nutrition. This study is the first duty of physicians who practice among children."

I think you will all agree that in the large majority of cases breast milk is the best and most satisfactory food for the infant, but unfortunately the number of women who cannot, or will not, nurse their babies, is increasing rapidly. Moreover, there exist those rather exceptional cases in which the mother's milk seems absolutely to disagree with the child. How, then, are we to feed our little patients, and I use the term "patients" advisedly, for in the majority of cases the artificially fed infant becomes a true patient sooner or later.

Three methods are open to us: 1. Wet nursing. 2. Modification of cow's milk. 3. Proprietary goods.

I shall dwell but a moment on wet nursing. If a good nurse can be secured, and the child thrives from week to week, it is a very happy solution of the difficulty. In Austria, particularly in Bohemia and Mahren, and in the large cities, as Vienna and Prague, wet nurses are obtained as we obtain trained nurses for our surgical and medical cases. They are licensed and are thoroughly examined before being sent on a case. Until some such supervision is exercised in this country the quality of our wet nurses must remain problematical. Moreover, the wet nurse is a luxury which, of necessity, is confined to our well-to-do patients.

If we allow that in most cases breast milk is the proper food for the infant, then if we can artificially prepare a mixture which shall duplicate breast milk, it seems that such a mixture ought to fulfil our requirements. This we endeavor to do by the modification of cow's milk.

The three constituents of milk which concern us most are the fat, carbohydrates, and proteid, and it is the proper proportion of these three that we endeavor to obtain. Average cow's milk from a mixed herd will contain 3.5 per cent. fat, 4.5 per cent. sugar, and 4 per cent. of proteid. It is neutral, or slightly acid in reaction. Average woman's milk ten days after delivery contains, fat, 3 per cent.; sugar, 6.5 per cent.; proteid, 1.5 per cent. It is neutral or slightly alkaline.

The most striking difference, of course, is in the percentage of proteid—4 per cent. in one case, 1.5 per cent. in the other. There are other differences in these proteids besides mere quantity. The amount of proteid substances in cow's milk coagulable by acids is about four times as great as the non-coaguable portion; whereas in woman's milk the non-coagulable portion is twice as great as the coagulable. For this reason cow's milk in the stomach is coagulated into large curds which digest slowly, while the coagulum of breast milk is loose and flocculent and readily digested. In this lies the cause of much gastro-intestinal disturbance in milk-fed babies.

The home modification of milk is much simpler than is ordinarily supposed. Cream, milk, water, milk sugar, and a glass graduated in ounces are all that is necessary. It is convenient to have a jar with a tap in the bottom, through which milk can be drawn from under the layer of cream. If a quart of average milk be set on ice for five hours, 10 ounces of 8 per cent. cream can be taken from the top. If allowed to stand 6 hours, about 6 ounces of 12 per cent. cream can be obtained. These two strengths are the most convenient to use. It must be remembered that cream is merely super-fatted milk—the amount of sugar and proteid being practically the same as in whole milk. If whole milk with a formula of 3½ per cent. fat, 4¼ per cent. sugar, 4 per cent. proteid be diluted with 3 volumes of water, the resulting mixture will have the formula of 0.8 per cent. fat, 1.1 per cent. sugar, and 1 per cent. proteid. If a 12 per cent. cream be diluted in the same manner, the resulting mixture will have the formula of 3 per cent. fat, 1 per cent. sugar, 1 per cent. proteid. The fat and proteid are correct, but the sugar is far too low. If, now, in diluting we use instead of water a solution containing 7 per cent. of milk sugar (that is, 1 ounce of sugar to 14 ounces of water), the mixture which we get will have approximately the proportions found in breast milk, which is 3 per cent. fat, 6 per cent. sugar, and 1 per cent. of proteid. By using the 8 per cent. and 12 per cent. cream, and by using the sugar solutions 5, 6, 7, 8, or 10 per cent., any desired combination of percentages may be obtained. If it is desired to reduce the fat still lower in proportion to the proteid, plain milk may be diluted with the proper sugar solution. It is well to remember that when diluting 12 per cent. cream, the fats are about three times the proteids; when diluting an 8 per cent. cream, the fats are twice the proteids; and that when diluting whole milk, the fats and proteids are about equal.

In most of our large cities are established the so-called "milk laboratories," such as the Walker-Gordon, in Boston, to which physicians can send prescriptions for milk as they send to the chemists for drug prescriptions. In this laboratory milk of the most minute variations of percentages can be accurately compounded. Moreover, the milk used is procured and kept under the most sanitary conditions. Notwithstanding these seeming advantages, many physicians find that laboratory milk does not agree with the average infant. In other words, though chemically perfect, it fails clinically. Dr. Louis Fischer, of New York, ascribes this failure to the fact that all fat is removed by a separator, and that the food prepared for the infant is a recombination of this fat, with an alkaline solution of sugar and proteid. The natural emulsion, in fact, is destroyed. That, in some way, lessens the digestibility of the proteids and leads to malnutrition. Even with proteids, reduced far below normal, there is still non-digestion and non-assimilation. On the other hand, home modification in capable hands is still a natural emulsion, having for its basis unseparated milk or cream, containing fat, sugar, and proteid.

Milk from our farms is far from being a sterile product. Indeed, it is sometimes not even clean. In this connection, I wish to quote from a paper of Prof. Adolf Baginski, on "The Milk Supply in the Kaiser and Kaiserin Frederick Children's Hospital in Berin," in which he says that "before milking, the stable is cleaned with a damp cloth. All the dirt is removed and finally the stable is cleaned with water. Prior to milking, the Swiss milkmen are compelled to thoroughly cleanse themselves, giving especial attention to their hands. Great stress is laid on washing the udder of each animal with warm water and soap, and drying with clean cloths. The milk is not allowed to remain in the stable, but as soon as a pail is filled it is at once removed to the dairy."

If such precautions as this could always be taken, Pasteurization and sterilization of milk would become unnecessary. On most of our milk farms, however, little more is attempted than to rid the milk of the macroscopic dirt. Most pathogenic germs are destroyed by Pasteurization, and the composition of the milk is little affected. Sterilized milk undoubtedly is changed chemically, and it is the opinion of most men qualified by experience to speak, that the exclusive use of sterilized milk will ultimately result in rachitis or scurvy. If the public could be interested and instructed much could be done to better the conditions under which our milk is produced. Precautions, such as mentioned in Professor Baginski's paper, can, of course, not even be considered, except in isolated instances; but it seems that concerted action might result at least in the elimination of some of the more objectionable features connected with our milk supply.

It remains to speak briefly of proprietary foods. When I left the medical school I was imbued with the idea that no proprietary food was fit for the infant digestion; but during my brief apprenticeship in private practice I have discovered, as probably many have before me, that, in some cases, the most theoretically indigestible mixture is well taken and assimilated when a scientifically modified milk is not at all well borne. The trouble with many proprietary foods is the presence of unconverted starch, which should not be well digested by the infant. The trouble with still more is the deficiency of fat. Two or three of these foods, particularly Mellen's, differ but slightly from the proportion found in breast milk. Mellen's food, properly prepared, is indeed remarkably like mother's milk; but a large proportion of cow's milk or cream is used in preparing it. To me one great disadvantage of the prepared foods is the difficulty in changing the proportions to meet individual cases and emergencies; whereas this very point is one of the advantages of modified milk. Moreover, in modified milk one has a fairly accurate idea of what the various proportions are. To my mind, it is far more rational to first try modified cow's milk in all cases. If, after thorough and painstaking trial, the child does not thrive, then resort to one of the proprietary foods, preferably one which contains no unconverted starch.

I wish to say in conclusion that I am aware that there is nothing original in this paper. My object has been merely to bring again to your minds this most important subject. At a recent medical meeting in Portsmouth, one of our senior members said that when he graduated from the medical school he thought he knew all there was to know about infant feeding; but after thirty years of practice he had decided that he knew nothing whatever about the subject. Certainly, in a subject as difficult as this, no time spent in its study can be considered wasted.

A PLEA FOR THE CHILDREN.

By W. C. Chapman, M.D., Toledo, O.

Every child born of healthy parents begins life with ability to overcome the ordinary impositions of modern civilization. From the first breath an infant begins its physical development. In a little while mental growth is noticed and lastly the child becomes morally responsible for its actions. Thus a character is built, more or less perfect, as a harmonious whole is the resultant of a well-balanced development, a strong body with weak mind produces a moral pervert, or a strong mind with weak physical development leads to early death. Modern civilization errs in establishing fixed rules for the government of the young for the reason that no two individuals are physically, mentally or morally alike. Environment may be made so obnoxious as to develop a character opposite to that which was intended. Fads, the curse of medicine and humanity, are accountable for much human depravity; fads in feeding, fads in study and fads in religion are accountable for much of the misery of the world. Let the child eat and study and go to Sunday school, but don't keep all candy away for fear that the teeth may be injured; don't compel the reading of prose when poetry is the more pleasing, and don't make Sunday the day of days to be looked back upon in after life with regret. The restraining, directing care on the part of the teacher must be intelligently followed, education being the objective, but starting with false conceptions as to what education should be mistakes are constantly being made. Children cannot be treated as a concrete mass, individualism obtains here as elsewhere in nature. The possibility of development in certain lines can only be known by study and observation. It is cruel to compel a child to sit an hour a day at the piano if there is no musical soul to be developed.

Education is the development of the faculties in symmetrical proportion. Every process that broadens the whole man is an educational process. Some may have peculiar inclination for particular branches of study; such should be encouraged, but only after the ability to acquire has been shown. Special investigation leads to specialism; it is well this is so, for the store house of knowledge is so full that no mind can grasp the whole.

In my "Plea for the Children," I desire very briefly to express my views as to methods which, if followed, will obtain best results.

School life is supposed to begin at the age of six. There should be many exceptions to this rule. Some children are older in every way at six than others at eight or nine. Parents should be advised to defer entrance into school until both physically and mentally the child has developed so as to be equal to another at six.

As a healthy mind can remain so only in a healthy body, so can physical well being be retained only when surrounded by conditions which are health supporting. So as of first importance I plead for as nearly as possible perfect sanitary environment. This applies to both building and grounds. Possibly because of financial limitations architects and other authorities plan and build absurdities. School buildings are in most cases neither beautiful to look upon nor healthful nor convenient for intended use. Bad ventilation, bad heating and bad lighting are the rule, with few exceptions. I do not believe it possible to erect a structure the size of the ordinary city school building and overcome these difficulties. In many locations the lot selected was at the time large enough for a small building and sufficient surrounding playground, but with the city's growth came the necessity for more rooms, and additions were made until at the present the lot is covered with a dark, dismal and forbidding structure only to be compared to a reformatory or penitentiary. Into this structure are congregated hundreds of growing children who spend hours during the day, working by artificial light and being poisoned by impure air. To such a building the little red brick country school house is a gem.

It is said to be easier to tear down than to build. In this case it does not seem so to me. It is not impossible to reconstruct. Possibly it would be a little more expensive, but the improvement in all directions would be the compensation. Why is it not possible to dot a city with beautiful little buildings with garden and playground large enough for all the scholars to enjoy? In no case should there be more than two or three school rooms under one roof, and always a room for manual training, another for physical exercise, not overlooking a large assembly room where all could unite in general exercises, and which could be open for the use of the people in the evening. Here might be heard lectures and music with little or no cost. Never should more than one hundred children be gathered into a school building, and the scholars should be of nearly the same grade. I would have the rooms furnished, tables taking the place of desks with seats attached, now so generally used to torture the majority of children.

Put rugs on the floors and adjustable chairs at the tables. Make in fact a little home in place of a prison and much will have been done to encourage the scholar in physical, mental and moral development. This same change should be made in the high school arrangements. Let there be many buildings in different parts of the city. The crowding into one building of over a thousand children, as is often the case, is criminal, and it should be discontinued as soon as possible.

Having considered the proper environment for symmetrical development, attention should be next given to the physical condition of the child, which will as it enters school life be subjected to novel experiences. These, through their strangeness, will have a marked effect upon the nervous susceptibility of the child. A writer has said: "In the United States practically all the children between six and fourteen years of age are in school. This is the impressionable age, psychical, spiritual and physical as well as intellectual. This is the happiest period in which to give the mind, the soul, the intellect, and the body the right bent for future usefulness and pleasure. It is as well, the period when thoughtlessness or ignorance or both may ruin the future usefulness of some citizen, who to be of greatest utility to his country must have character as well as morality, and a sound body as well as a sound mind. * * * We send our children to school at six, with eyes yet immature and tender, and require them to do an amount of work which an all-wise Creator never intended they should do at that age. * * * The nervous wrecks, the choreics, the epileptics, etc., that may be developed at this period none can tell." (Dr. Timberman.) At this period second dentition has just begun, not to be completed for years, or until possibly the child has left the school. Teething may not be a disease, but experience demonstrates the extra nervous strain with its restlessness and worry that accompanies the eruption of the teeth, which is often overlooked by teachers and parents. The Almighty has created the human race with crises of physical development when man becomes man, and woman, woman. And this tremendous change comes at the time when the school curriculum demands greatest work and closest application. Weary in body and depressed in spirit, the physical is sought with hope of relief. When advised to rest, quit school and take a vacation, the answer is "that is impossible; my test examination comes next week; and if I do not pass, my year's work has gone for naught."

It is one of nature's laws that children must be active. To compel them to curb this activity by placing them in constrained positions on hard, ill-fitting seats for an hour, is not conducive to symmetrical growth of mind or body. Let me refer again to the number of diseased eyes that are seen everywhere, made manifest by the number of children, as well as adults, who are compelled to use spectacles. Babies at birth are always hypermetropic. Those who as they mature do not do close work remain so, but in our modes of education, not only by reading or writing, but by close appliance to manual labor, all are liable to become emmetropic, the perfect vision, unfortunately passing to the diseased condition of myopia generally with attendant astigmatism. The penalty for close application is a diseased eye, but the attendant strain should be removed as much as possible. Examination of all eyes should be imperative on entrance into school, and if defect is found, suitable spectacles should be fitted after scientific examination. In a paper read before the State Board of Health last year, to which I have previously alluded, Dr. Timberman of this city, after careful examination, said that he found 40 per cent. of the scholars suffering from defective sight. There should be a medical examiner of schools, with power to send home any scholar who may be suffering from any disease, at the same time notifying parents to call in their regular family attendant for advice.

The value of manual training and physical exercise cannot be too strongly urged, not only for development of the body, but of the mind also.

A difficult problem that confronts educators is the one concerned with determining the mental capacity of the individual scholar. If no two persons are alike physically how can they be so mentally? Physical differences are seen without much difficulty, but the capabilities of the mind are so hidden as frequently to deceive a careful observer. As good a plan as any is to classify according to the average ability at certain ages, but this plan is subject to many exceptions. There are the unusually bright and the unusually stupid at both extremes, and to care for these scholars is perplexing. It is much easier for some to memorize than others; also to form the habit of study. These have a comparatively easy time, while others who attempt to keep up may end in a complete breakdown. If after a trial a scholar is not able to keep up with the class, there should be no hesitation in so informing parents and advising a less advanced class. It is often possible for two terms to be combined, thus advancing a bright scholar more rapidly.

There is a method employed in many schools that I always decry. That is the matter of periodic tests to find out how much the scholar knows. These tests are abominations; to them is due much of the nervous trouble noticed in the scholars. Every physician in the room has had many cases of sickness where the irritation of a coming test has put the conscientious scholar to bed. The anxious dread of a failure leads the child to cram for the occasion; such learning to be forgotten very soon. Every teacher should know after a time of observation whether a scholar understands what has been taught and is worthy or not of advancement. Do away with the tests, and you will have done much to prevent after neuroses. A good education does not imply the smattering of many subjects. One may be well informed about a few things, but it is not often one can be a specialist in many things. The habit of study being acquired let the individual select the subjects. Anatomy and physiology are ordered as a part of a course of instruction. Better go a little deeper into reading, writing and arithmetic. These will be useful in after life. The others may never.

I cannot close my brief paper without referring to the necessity for greater attention to the moral development of the scholar. Every sane mind has the power to think, and from such thinking deductions may follow that may remain permanently established. An infant has the power to see from birth and shortly after develops the ability to observe; this observation soon establishes relations with the world. Long before school life has begun there has developed in every child an individual character which must vary with environment. The teacher can only by the closest study recognize that even the youngest may have imbibed ideas that will require patient toil to eradicate. To change a depraved nature requires patience and power. It is known that no one can stop thinking; that action comes only after planning, and to plan requires thought. The substitution of good action for evil necessitates a long-continued effort to explain what is good and what benefits arrive from good words and good deeds. Discipline without showing the reason for it never improves one, and corporal punishment never benefits, but engenders revenge and hatred. Fear never ennobles and goodness performed in fear of punishment is not goodness at all. Subjugation by inflicting bodily pain is not moral discipline. "I whip you because I love you" never has been accepted as true by any youthful mind.

I am convinced that the power for betterment comes largely from the teaching of self-government. Scholars soon find that most pleasure comes from the desire to do good and to be good. The question presents itself once in a while as to what to do with a scholar who seems so depraved as to be beyond all hope of reformation. If the teaching, not the preaching of the teacher does not change such a one, I am sure bodily chastisement will not be more successful. It is a problem to know what to do with such. Removal from school seems best to me. Is it right to degrade a whole school by the presence of one black sheep?

That a change is necessary in some of the regulations of our schools is my belief. In my plea for the children I ask for no fads nor wish to make any radical changes in established rules. I am sure that in the building of smaller school houses, less crowding of scholars under one roof, with environment appealing to the esthetic nature, with means for physical exercise, as playground and gymnasia, the possibility to secure broader mental development will be certain. Morally the advance must be made along the lines of self-government, by developing a power of thought that will demonstrate the necessity for such government. That this is possible is conclusively proven in Toledo by Miss Brownlee's La Grange School, and Mr. Gunkel with the newsboys.

PHILADELPHIA PEDIATRIC SOCIETY.

May 9, 1905.

President, J. H. McKee, in the Chair.

Sclerema Neonatorum.—The scientific program was opened by Dr. J. P. Crozer Griffith, who presented a case of sclerema neonatorum. He informed the society that although this disease was known to the writers on medicine in the time of Galen, it is rare and, when he reported his first case in 1897, but five cases had been described in this country, although many had been mentioned. The condition is characterized by a hardening of the tissues of the subcutaneous structures and is associated with asthenia. The mother of this child died ten days after delivery, since which time it has been under the care of the mother's sister, who states that the skin of the child has been hard and wrinkled from birth. When the patient first came to the hospital the skin was very much more firm than at the present time, and it has improved so much under the massage that Dr. Griffith is convinced a cure will be effected. He stated that of all the cases reported in this country the first one described is the only one that did not die.

Meningitis.—Owing to the exacerbation of the disease in some of the patients, and to an intercurrent attack of measles in another, Dr. Alfred Hand, Jr., was unable to present the cases of meningitis which had been scheduled on the program. He spoke of the points of differential diagnosis between the fluid obtained from lumbar puncture in cases of tuberculous and cerebro-spinal meningitis. In the tuberculous meningitis the albumen contents of the fluid is increased, but not to the same extent as in the cerebro-spinal; in the former the sugar was never absent, whereas in the latter it may disappear. With reference to the staphylococcous thought to be associated with some of the chronic forms of meningitis he said that if bacteria other than the pneumococcus, diplococcus intracellularis, the streptococcus, and possible the bacillus typhosus and coli communis were present in inoculations from meningeal fluid, he regards them as contamination. In discussing this subject Dr. J. H. McKee referred to a case in which the spinal fluid must have been under great pressure, for he said he never saw fluid thrown so far from the trocar. Examination of the exudate revealed the presence of polymorphonuclear leucocytes, and the diplococcus intracellularis, but sugar was absent.

Inhibitory Power of Unheated Milk upon Bacteria.—

This paper was presented by Drs. J. S. Evans, Jr., and T. A. Cope. In the course of the paper they referred to the work of co-workers who maintain that the raw milk contains a body or bodies which inhibit bacterial growth for certain periods of time; they also referred to other investigators who found that animals suffering purely with a bacterial disease did not secrete the organisms through the milk. During their investigations they have found that as the milk after Pasteurization was going through the tubes the number of bacteria was greatly decreased, but after it was placed in the bottle the number increased, and now it was the bacillus subtilis that predominated, instead of the bacillus acid-lactici. They claim that Pasteurization should be done in the bottles in which the milk is delivered. The tests they have made showed that the percentage of bacterial growth is always greater in the Pasteurized milk than in the raw material, and then too in the former are spore-forming bacteria, while in the raw milk the lactic acid group are the principal bacteria present. In order to satisfy their conviction that the raw milk possesses some inhibitory action on bacteria growth they inoculated raw, Pasteurized and sterilized milk with various bacteria; they found that in all instances the increase of the growth of these organisms was retarded about four hours in the raw milk, after which time the growth was rapid; while in the Pasteurized the growth was rapid from the first, it being much more rapid in the sterilized than in the Pasteurized. They also found that the inhibitory action of the raw milk was more marked in some infections than in others. The germicidal action of the raw milk is also checked by ice. By developing a mixed infection in the raw milk it was found that antagonistic action can be elicited, for if the lactic acid bacillus or its group of organisms was present the bacillus grew slowly or not at all, and if the lactic acid bacillus was present in an inconspicuous number the bacillus subtilis grew luxuriantly. The coagulation and the acidity increased with the increase in the numbers of the bacteria. In opening the discussion on this paper Dr. Ravenel referred to men who demonstrated the bacterial power of the raw milk by the blood serum. In his opinion Pasteurization is the height of folly. He declares that the acidity decreases until a certain point when the bacteria have overcome the bactericidal power of the milk; then the acidity increases with the increase in the number of bacteria. Continuing the discussion Dr. Griffith made reference to the difference in the ferments present in human and in cow's milk, and stated that clean unheated cow's milk should be used when the human product is not available for the child. Dr. Pennington informed the society that the clean milk in making the modified article is contaminated by adding the cream and sugar of milk; she suggests that the last two named substances be boiled for a few minutes and then added to the clean milk (unheated). Heat applied to the cream, she maintains, will have very little effect upon its chemistry.

Encephalitis and other Organic Nervous Affections Complicating Scarlatina.—This paper was read by Dr. John H. W. Rhein. He outlined the symptoms the patient presented and gave the postmortem lesions laying particular stress upon the edema of the lungs, the fibrinous pericarditis and the marked nephritis. In the brain substance he found under the microscope a round cell infiltration, in the frontal the vessels of the pia were distended and hemorrhages were present. Bacteria were not found. He informed the society that little is known as to the relation of scarlet fever to encephalitis. He then spoke of the changes that result in the brain substance incident to other acute infectious diseases, saying that he has seen changes similar to those which he described in this paper consecutive to pertussis, and he cited hemiplegia as the most common complication of scarlatina, and aphasia as another complication, stating that he has seen this condition come on the first day of the disease. The hemiplegia is due either to hemorrhage, thrombosis or embolism. Tetany, choke-disc, epilepsy. disseminated sclerosis, hysteria, chronic hydrocephalus, paraplegia, neuralgia, psychoses, all of these conditions may complicate scarlatina. The prognosis of the complication is good for many. In opening the discussion of this paper Dr. Royer said in the nervous system too much must not be attributed to the scarlet fever, for the child also suffered with measles, acute fibrinous pericarditis and severe nephritis. In the exudate on the tonsils the streptococcus but no Klebs Lœfflers' bacillus was found.

CHICAGO PEDIATRIC SOCIETY.

A regular meeting was held March 21, 1905.

President, Dr. S. J. Walker, in the Chair.

Achondroplasia.—Dr. May Michael reported the case of a little girl who was brought to the Daily News Sanitarium last August on account of her small stature. The family history is negative; the father and mother have always been well; both are very tall. There are five children, the four others rather above the average height. The birth was a difficult one, on account of a transverse position of the fetus which necessitated version. The mother noticed at once that the child was out of proportion and that the head seemed too large for the body. She was breast fed and has never had any serious illness. Examination in August showed practically the same features as those at time of presentation. A 7-year-old child; bright and intelligent; well nourished; height, 38½ in. (normal 45.9 in.). Head, somewhat square, 21 in. in circumference (normal 20.2); hair soft and abundant; face large, bridge of nose depressed; palate high arched. Neck: thyroid not palpable. Chest: Clavicles thick and hard, bowed; xyphoid cartilage depressed; ribs everted; circumference 20-2/8 (normal 23-3/10). Spine: Marked lordosis in the lumbar region. Upper extremities: complete extension impossible; humerus 7½ inches from acromion to olecranon (normal 10 in.); ulna and radius bowed; distance from olecranon to the styloid process of the ulna 4⅞ in. (normal 7 in.) Epiphyses of wrists and elbows enlarged. Hands: short, stubby; fingers stunted, almost of the same length; index and middle fingers point toward the radial side, ring and little fingers to the ulnar side. Lower extremities: distance from anterior superior spine to exterior malleolus 19¼ in. (normal 25 in.); tibiae and fibulae bowed backward; all epiphyses enlarged. Feet: toes short and stubby. Abdomen somewhat prominent. Pelvis: distance between anterior superior spines 5½ in (normal 6½ in); between crests 6½ in. (normal 7½ in.); anterior posterior diameter 6 in. (normal 6 in.). Examination of viscera, negative.

These clinical features stamp the case as one of achondroplasia or chondrodystrophia fetalis, as it is called by some writers. According to Nathan the condition is a well-defined morbid entity, characterized by a defective growth of the enchondral skeleton, the base of the skull and the pelvis. This defective growth, microscopical examination shows, is due to a rudimentary row formation of the proliferating cartilage cells and an ingrowth, between diaphysis and epiphysis of a layer of connective tissue from the periosteum which completely separates them. In some cases there is a synostosis of the sutures at the base of the skull.

Of the etiology nothing positive is known. It has been ascribed to privation, hardship and injuries during pregnancy as well as to alcoholism and syphilis; but as these conditions are common and the disease is rare there must be some unknown factor.

Although the diagnosis of achondroplasia offers few difficulties there are some conditions from which it must be distinguished. Rickets, either congenital or postnatal, sufficiently severe to produce dwarfism would show funnel breast, bow legs, or knock knee, and would not present the short extremities and stubby hands of achondroplasia. Rachitic dwarfs usually have long arms. In rickets the bones are uniformly smooth, but in achondroplasia hard and thickened, and the anatomical landmarks easily made out. Microscopically the two conditions are distinct. In rickets the proliferating zone of cartilage cells uniting the epiphysis and shaft is much wider than when the development is normal; in achondroplasia much smaller; in rickets vascularization is more marked. The ingrowth of periosteum between epiphysis and diaphysis is absent in rickets. At first glance, achondroplasia may be mistaken for cretinism, but the harsh, dry skin, the coarse hair, protruding tongue, the myxedema, the lowered intelligence readily rule out this condition. In osteogenesis imperfecta, with which achondroplasia has been confounded, the bones are of normal length but deformed from multiple fractures. Pathologically the condition is due to a deficiency of osteoid tissue and defective osteogenesis, but is sometimes associated with achondroplasia. Mongolian idiocy is at once excluded by the mentality. The mongols are deficient mentally, while these individuals are bright and intelligent. As regards prognosis, a large majority die within a few days after birth or during infancy and childhood from intercurrent diseases, but a number reach adult life.

Little can be said of the treatment. Extracts from the adrenal and thyroid glands have been tried, but with little success. This child has been on thyroid extract since August and has grown ¾ of an inch.

In discussion Dr. Harold N. Moyer said: He was not prepared to discuss this topic in a systematic manner; but the case presented by Dr. Michael is undoubtedly one of achondroplasia. He had long been interested in these anomalies of development. There are curious phenomena presented by them, of which no adequate explanation has been offered, particularly the symmetrical asymmetry, which is the most puzzling thing about the disease. This child is perfectly symmetrical in its asymmetry; that is the humerus and the femur are of the same length on both sides;

and there is relatively the same length in the leg and forearm, and this has occurred, he believed in all of the cases—want of normal asymmetry, an unusually average long body, and invariably a short humerus and short thigh, with relatively long forearm and leg. In the report of the case I did not hear Dr. Michael mention the peculiar condition of the hands, which is so clearly shown in the skiagraph. The fingers have a peculiar enlargement. There are peculiar, cushion-like, fleshy masses on the first and second phalanges. This enlargement is not in the soft tissues, but in the bones, and it shows beautifully in the skiagraph. The short terminal phalanx is apparently normal. It seemed to him that this case and similar ones are referable to trophic conditions, in order to be so symmetrical in their manifestations. The French writers have gone into this type of cases, and particularly dwarfs, in relation to these cases at great length; but not all dwarfs are seemingly achondroplasics. Some of them are absolutely symmetrical in all parts, but the vast majority of them belong to the type of achondroplasics, presenting the anomalies that this child has.

Dr. Cook said he was interested in this subject, because he had a child under observation that is the counterpart of this case, except his patient is 15 years of age, and has grown six inches in length, although, so far as he could see, she has the peculiarities of the child exhibited in development. His patient developed a long face; she is fairly intellectual; she had a beautiful voice at 13, but it changed at 15, her present age. A vocalist informed him that her voice is mature.

HEMORRHAGE IN THE NEW BORN.—Dr. Dudley Jackson reported this case. While the hemorrhagic disease, he said, in the new born can hardly be called rare, it is certainly uncommon, and the doubt which still surrounds its etiology is sufficient justification for the report of the following case:

Mrs. K———, a primipara, thirty-two years of age, was delivered at term of a male child, weighing seven pounds, after a perfectly normal labor lasting twenty-seven hours. The child was apparently healthy, but it is interesting to note that the mother had a well marked exophthalmic goitre, and was suffering from a severe bronchitis and from varicose veins of both legs at the time of her delivery. The mother came from a family of eleven children, ten of whom were living and well, as were also both her parents, and careful inquiry failed to elicit evidence of syphilis or other constitutional disease. The father's history was negative. During the three weeks preceding delivery, the mother's temperature remained near the normal, the pulse varied from 108 to 150, and the respirations averaged twenty-four. At the end of ten days phlegmasia alba dolens developed in the right leg.

During the first twenty-four hours after birth nothing unusual was noted about the child, except that its temperature was subnormal, and it seemed disinclined to nurse. With the second day the temperature rose to 101 degrees Farenheit in the morning and by evening had reached 104-6/10 Farenheit; the pulse went to 186 and the respirations numbered ninety. At this time a slight quantity of bloody mucous was expelled from the mouth and the urine stained the napkin a brick red.

During the third day the temperature, pulse and respirations remained about as on the previous day. The meconium was black, with streaks of bright red blood and bloody mucous. At three a.m. the urine stained the napkin a dark red, and during the succeeding fifteen hours no urine at all was passed. The evening of the third day the babe was catheterized and five drachms of a dark chocolate-colored fluid was withdrawn from the bladder. The morning of the fourth day bright red blood was discharged from the urethra and umbilicus and shortly afterwards the child died.

The autopsy disclosed nothing abnormal about the umbilicus, bladder or gastrointestinal tract, but there were well marked subepicardial and subpleural hemorrhages; in addition there were evidences of broncho-pneumonia and many large hemorrhagic areas in both kidneys. The histo-pathological examination verified these findings and showed, in addition ,well marked areas of endothelial proliferation of the intestinal tissue of both the liver and kidneys.

The author said he was indebted to Professor Robert Zeit for the following report of the microscopic findings in the case: The bacteriological examination was negative. The pathological examination shows the following: In the kidneys the interstitial tissue is increased, showing much small cell infiltration. The tubules are dilated, showing the lining epithelial cells swollen and granular in some places, and markedly degenerated in others. The glomeruli show endothelial hyperplasia; the Bowman's capsules are dilated, and there are large interstitial hemorrhages. The thymus shows marked hyperemia in a few necrotic areas. The lungs show much thickening of the alveolar septa, and small cell infiltration and hemorrhages. The liver shows interstitial hepatitis, thickened walls of blood vessels, hyperemia, and cloudy swelling; and the myocardium shows slight hyperemia and cloudy swelling.

The anatomical diagnosis is therefore: (1) Interstitial fibroid pneumonia; (2) hemorrhagic interstitial nephritis; (3) interstitial hepatitis; ;(4) subepicardial and subpleural hemorrhages, and (5) large hemorrhages into the cortex of the kidney.

There seems still to be a great deal of doubt as to the cause of these hemorrhages in the new born, and from a review of the iterature it is apparent that there exists a tendency to confuse cases of hemorrhage, due to trauma during the birth of a child, and cases of true hemophilia with these cases of spontaneous hemorrhage.

It is probable that the disease is due either to an infection with a micro-organism as yet unknown, or to some inherited constitutional disease, such as syphilis. The fact that epidemics of the disease have been known to occur in maternity hospitals, that the malady seems to be self limited, nearly always developing within the first four days of life and terminating within two weeks, the high temperature and the fact that the disease affects both sexes alike would lead one to favor the theory of its infectious origin, while the microscopic findings in the case under consideration point strongly to syphilis as an etiological factor.

Ichthyosis.—Dr. Julius H. Hess presented a case of ichthyosis. He briefly pointed out the salient features of the case. The patient's hair is very dry and harsh, and apparently no oil in it at all. All over his body large scales will be seen; along the side of the thorax, on both sides especially, they present that polygonal shape that is described in most of the text books. He had a great deal of trouble with hypertrophy of the foreskin, which becomes edematous very frequently, so that he is distressed considerably. This was repeated at very frequent intervals. There were one or two interesting points in the course of the illness. This condition was first noticed when the boy was about ten days old. As soon as the boy's mother left her bed she noticed the child's skin was not normal, and that it gradually grew worse until it assumed the condition it is in now. This condition has remained constant except for shedding in small areas. There were no decided changes until he was about three years of age, when he had the measles and what appeared to be, from the history, a typical rash. After this most of the skin came off, but within a short time after that it reappeared in its present form.

A most interesting feature of the case is that he belongs to the "never sweats," but he has been redeemed. About six months ago last summer he began to sweat for the first time; first along the spine, then about the chest anteriorly, and he has kept that up since. With that there has been a very marked improvement, so that, to all appearances, the child is getting well. When Dr. Hess first saw him, the condition of the scales and his general condition were far more marked than at the present time. There is every reason to believe that he is going to get well. Dr. Abt saw the case about a year ago, and if he remembers the boy, he will notice a decided change without therapy. Glycerine solutions, differen ointments, salicylic acid, resorcin, betanaphthal, etc., were tried without any results. He was put on potassium iodide internally also arsenic internally, without any results. He was afraid t try pilocarpin, which is recommended in these cases. There was n improvement up to the time he began to sweat, but since then h has been gettting better. The X-ray was suggested, but at th time the father was adverse to its use, so that he has never had X-ray treatment. If it had been used he thought it would have gotten credit instead of nature, for he is getting well.

SARCOMA OF THE BRAIN, WITH DEVELOPMENT OF ACUTE SYMPTOMS TWO WEEKS AFTER AN ADENOID OPERATION.—Dr. Julius H. Hess described the tumor in this case, and then gave the history in detail because it was of decided interest to all pediatricians, as it kept the attending physician in hot water for five or six months. The child received a blow on the head with a brick a year and a half ago. On examining the skull there were no findings in that region. The dura was very deeply injected all round; there were no other changes except at the base, where there was a slight meningitis. In no part of the dura were tubercles visible. The pia presented about the same condition. Upon external examination of the brain there were no visible changes. Upon sectioning the same and opening into the lateral ventricles a large mulberry-like mass was noticed in the anterior horn of the left lateral ventricle which goes through the corpus callosum into the anterior horn of the right lateral ventricle. This mass was about the size of a large egg, reddish brown in appearance, and containing no nodules. The posterior horn of the right lateral ventricle was filled by a similar mass. The choroid plexuses on both sides were normal. There was also very marked internal hydrocephalus. In the tumor mass of the posterior horn of the right lateral ventricle was a small cavity containing seropurulent matter, whether a product of necrosis or pus is unfortunately unknown, and anterior to this were four small cysts containing clear fluid. The right ventricle was filled with a sero-purulent fluid; the left with a clear fluid. The anterior half of the right lobe of the cerebellum is composed of a tumor mass. Microscopical examination shows a small round-cell sarcoma. Although the specimen is interesting, the history s more so, and is as follows:

History.—Clara S., aged 5 years; 1½ years ago received a blow on the head with a brick one-half inch to the left of the median line of the forehead at the hair line. The wound bled profusely and caused headache for ten days, which disappeared, and she regained her usual good health. One year ago she complained of earache, which was followed by a purulent discharge from the same ear. (Side not remembered by mother.) Six months ago suffered from recurrent headaches, which mother described as "spasmodic flashes," coming on suddenly with flushng of face; severe pain, and shortly disappearing. These coninued more or less irregularly up to October 19, 1904, four and one-half months ago, when both tonsils and a large mass of denoid vegetations were removed. Two weeks later she comlained of severe headaches and dizziness, followed shortly after y several attacks of cyclic vomiting, apparently without cause, and without definite relation to the time of eating. Also suffered at this time from vertigo and internal strabismus of right eye, which cleared up in three days. During this time the temperature ranged between 98.6 and 103 degrees Farenheit. Pulse not remembered. She also complained of severe frontal headaches and pains in the right shoulder and arm, apparently due to nerves of brachial plexus. Flexion and extension of head at this time produced no symptoms.

The above symptoms improved with irregular exacerbations, and three weeks later she developed what appeared to be a spasmodic torticollis. Still later, when the torticollis disappeared, she had photophobia, and mother noticed ataxia in gait. Since then these symptoms have persisted with some improvement at times. Mother noticed also limpness in left arm, which improved, but did not entirely disappear. Headaches appeared suddenly, which, at rest, disappeared as suddenly. While out walking suddenly complained of blackness before eyes, and had to be taken home and carried.

March 10, 1905, 10 a.m., again saw her. Right side facial paralysis with paresis of left leg, and weakness of left arm, although able to grasp my hand with considerable vigor. Remembered my name from visit two months previously; mouth drawn to left in speaking, and right eyelids do not close. Photophobia. Tongue slightly drawn to the left; cannot make grimaces with right side of face. Slight strabismus of right eye, having apparently not improved. Some retraction of head; severe frontal headache, and drawing up of legs; pulse 80; pupils react to light sluggishly; tache cerebrale; abdomen retracted; reflexes absent.

6 p.m. Opisthotonus; legs flexed on abdomen; and child comatose; temperature 99.8 degrees Farenheit, pulse 108.

March 11, 1905, 10 a.m. Temperature 100.6 degrees Farenheit, pulse 108. Opisthotonus; legs flexed and rigid; child comatose; pupils react, left fairly well, right very sluggishly; choked disc. Bowels moved involuntarily first time; spine apparently very sensitive in cervical region; knee reflexes absent.

An interesting feature of this case is that she had very few symptoms before the adenoid operation, but unfortunately two weeks after the operation she began to have many symptoms, which led to the supposition that the operation may have been a direct etiological factor in her illness, which was fortunately disproved at the autopsy.

Dr. Harold N. Moyer said he had seen tumors like this in children with such an anomalous history as the doctor has read. He recalled one case in particular, with the exception of the postmortem findings. There was no doubt it was a cerebral tumor from the clinical findings. For many months during the development of the disease there were no symptoms indicative of cerebral tumor. The child had attacks of sudden blindness, so that the family physician believed it to be suffering from hysteria. At the time he saw the child it had well-marked choked disc, and died within twelve hours thereafter. Two or three days before death it was down town with its mother. The difference between the clinical picture of an adult and that of a young child is due to the flexibility of the skull and the toleration of the skull of the child to pressure, which is much greater than that of the adult, the bones being more yielding, and if pressure is slow there is much greater accommodation for a tumor inside of the child's skull than there is inside of the skull of an adult, and that, he took it, makes the difference between a growth within a child's skull and that of an adult.

HYSTERIA.—Dr. Samuel J. Walker reported a case that is rather unusual and quite instructive. On December 28 last, a child, nine years of age, was brought to him from one of the suburbs. The following history was obtained: The mother is a healthy, strong woman, but a little inclined to be nervous. However, she was not really neurotic. The father is migrainous, but otherwise a strong, healthy man. There are three other children, the youngest four, and the oldest twelve, all of them strong and healthy. This child had passed through normal infancy; had had measles at two and a half years of age, and had had adenoids and tonsils removed at the age of three. It had scarlet fever, without any complications, at the age of six, and an attack of influenza in the spring of 1904. Otherwise the history was negative.

The reason the child was brought to him was, that in the latter part of November the mother noticed the child's appetite was decidedly below normal. She took the child to the family physician who prescribed tonics, etc., but without any improvement in the appetite. This condition persisted from the latter part of November until he saw the child, so that within a period of five or six weeks it had lost twenty pounds. The child had weighed 74 pounds, and when he saw it it had lost 22. He went over the little boy very carefully and was unable to find a single lesion. He did not believe he neglected anything he was justified in carrying out at that examination. Blood examination showed hemoglobin was 80 per cent., and the red cells, 4,460,000; whites, 7,200, and stained specimen negative; urine negative. Heart, lungs, abdomen, and fundi were negative. The child was put to bed and given forced feeding. He started in with milk, raw eggs and beef juice. The temperature was taken every three hours, and the child watched carefully. This was on December 28th. He heard nothing further about the child until January 18th, 1905, when the physician who took care of him telephoned that he would like him to come out and see the boy, which he did. He went out on that day, January 18th, and again went all over the child very carefully, with negative findings. The lungs, heart and abdomen were normal. He made another blood count, which showed 70 per cent. hemoglobin; reds, 7,400,000; whites, 7,100; urine negative. He said the findings were negative, but there were several findings at the time which were significant. The pulse was very slow, and somewhat irregular; it varied between 46 and 54, not over 60, and not under 45. The abdomen was retracted very markedly, almost tonic spasm of the abdomen. The abdomen was right up against the spinal column. The child's disposition had changed considerably, so that it was very irritable and cried a good deal. It did not want to see its mother at times, and then again it did not want to see anybody but its mother. It was altogether unreasonable and in an extremely irritable state of mind. It slept well, and took milk and eggs with a great deal of opposition. Everything it took in the way of food it did so with reluctance. The fundi were examined on that day and found negative. Dr. Alfred C. Haven and he thought at that time the child presented some features of an insidious tuberculous meningitis, considering the retracted abdomen, the slow, irregular pulse, the change of disposition, the gradual emaciation, etc., without any objective signs further than that. They thought that might be the explanation for the condition. He suggested that they have further consultation, and the parents wanted Dr. Arthur R. Edwards to see the child, and he went out three days later with him to see it. This was on January 21st. Again, the child was subjected to a very thorough examination by Dr. Edwards, who was unable to find anything more than had been found. Everything was done except lumbar puncture, which we thought they were scarcely justified in resorting to at the time. After talking over the situation they came to the conclusion that they were justified in making a diagnosis of tuberculous meningitis, as they did not see what else could account for the symptoms the child had; that is, a very marked change in its disposition; a pulse which had become as low as forty at times, and persistently irregular, and ranged in the forties; the temperature during the last week was normal or subnormal. This militated against the diagnosis of tuberculous meningitis somewhat. However, they thought this was the explanation of the child's condition, and so stated the diagnosis to the mother and father. The following week the child rather improved; at the end of five days he said that the case could not be one of tuberculous meningitis, in his opinion, but what it was he did not know. So Dr. Patrick was asked to come out and see the child. He saw the child, went over it very carefully, and could not find anything. Dr. Patrick advised that they give the child more milk, instead of giving it a quart, give a quart and a half or two quarts; that the mother be kept from the child as much as possible, and the case treated as one of functionable trouble. This plan was carried out very much in opposition to the mother. She did not want it done; she thought the child was sick, and needed her, and that the chances were it would not get well, and that her place was near it. They told her that this plan was the only one under the circumstances. No medicine was given the child all this time, except something for the bowels. At the end of a week under this treatment the child gained seven pounds; but the other conditions remained the same, that is, the slow pulse, retracted abdomen, irritability, etc. The week following it gained two pounds, and the week following that two pounds. March 15th the mother came to his office and said that the child had gained three and a half pounds in each of the last two weeks, so that it now seemed perfectly well and robust, and was going out. The diet had been largely increased, but the control of the child was rather rigid. With the termination of the case in this manner, there is in his opinion only one diagnosis possible, and that is hysteria. This case serves to emphasize how important it is for us to keep in mind the possibility of hysteria in childhood, and as complicating many of the diseases of childhood. The aggravated form of hysteria, such as this child presented, does not often occur in childhood; but the milder manifestations are not at all uncommon, as we all know. The pulse varies at present between 70 and 80. It came up gradually, and it is regular now.

Dr. Abt said the proof of the pudding is the eating of it. He thought they had tasted the pudding. It seems to him, with the investigations and examinations carried on by eminent clinicians in this case, they should be willing to agree with Dr. Walker that the case was not one of tuberculous meningitis, but of some form of neurosis brought about by a condition of starvation.

Dr. Churchill said, that as Dr. Abt had said that he was able to verify the diagnosis of tuberculous meningitis in only five per cent. of the cases in which lumbar puncture was resorted to, he would like to know how far he has carried his investigations by inoculation. Of course, we do not get bacilli in the spinal fluid except rarely, but in most cases of tubercular meningitis we will get them by inoculation experiments.

Dr. Moyer said, with regard to Skeer's sign, that it is a cloudy condition of the iris, not exactly at the border of the iris, but between the opening of the iris and its attachment. When Dr. Skeer read his original paper, in 1883, before the Chicago Pathological Society, a committee was appointed, consisting of himself, Dr. Lyman and Dr. Danforth, to investigate this sign. Dr. Skeer claimed that this sign was pathognomonic of meningitis. The experience of the committee was, after investigation, that it did not agree with that conclusion, but that Skeer's sign was found in about one-third of the cases of meningitis we examined. In blue-eyed children it would stand out with great distinctness, but not so in dark-eyed children. Dr. Skeer went so far as to say that in those cases in which we did not find the sign, tuberculous meningitis was not present. That is the way he disposed of it.

Dr. Vanderslice said a word or two more with reference to Dr. Skeer's sign. Dr. Moyer and Dr. Brower know something about it. He agreed with Dr. Moyer that in light blue and gray eyes it can be seen; but in dark eyes he doubted if anyone can see it. The sign that is seen in the normal child is not Skeer's sign. He believed, from the description of Skeer's sign in the text books, it is impossible for one to recognize it. It must be demonstrated or pointed out to him before he can recognize it. He believed that one cannot always make a diagnosis whether Skeer's sign is present or not, but he had made a diagnosis several times on absolutely nothing but Skeer's sign. He believed if one finds Skeer's sign, there is tuberculous meningitis. Dr. Brower reported 11 cases in which this sign was present, and with the backing the sign has it should not be smiled at in this Society. It is one of the most valuable signs in tuberculous meningitis, and a great mistake is made if it is not looked for in all suspicious cases.

Dr. Moyer said he was very glad to hear what Dr. Vanderslice had to say about Skeer's sign. Dr. Skeer was an old practitioner and a good observer. He studied this sign for thirty or forty years. In a number of instances he thought one saw Skeer's sign in some of our cases, and when he had Dr. Skeer examine them with us, he pointed out what were spurious signs and what were the real ones. The trouble with our investigation was that it was not followed long enough. We kept it up for nearly a year, going from one hospital to another, looking for this sign. It is a little premature to dismiss this sign as being worthless, because it has not been thoroughly worked out.

Dr. Walker said as to the percentage of cases in which tubercle bacilli were found, when he said it was 30 to 45 per cent., it was not based on his own experience, because he had only resorted to lumbar puncture in four cases that he knew to be instances of tuberculous meningitis, and he had only found them in one. As to whether this child presents any physical signs or stigmata of hysteria, he was not able to say, as he had not seen the child since the 21st of January. However, he had received reports from the family physician from time to time, and the patient is improving. As to the Skeer's sign, he was not smiling at reference to it. Personally, he had not looked for it, as a rule, but he was glad to hear so much said about it, and he should look for it in the future, because anything that will help in the diagnosis is of value. As to the diagnosis of hysteria in this case, there can be no doubt. He did not see how there could be.

EDITORIAL

RECENT RESEARCHES IN THE ETIOLOGY OF SYPHILIS.

In view of the thousands of children who are brought into the world predestined to all the disasters implied in congenital syphilis, anything which promises to throw light on that dread disease is of intense interest to pediatricians. Although it is too soon to claim anything conclusive as a result of investigations into its etiology, nevertheless some discoveries have been made which at least suggest promise.

Some three years ago Bordet and Gengou discovered a microorganism in a syphilitic chancre, but failing to find it in some lesions studied later, did not carry further the search for it. More recently Schaudin and Hoffman have found this microörganism, which they have termed *spirochæta pallida,* in stained and fresh specimens from the surface and interior of the primary lesions and the interior of lymph glands and condylomata. It was never found in non-syphilitic lesions which were studied at the same time, and failure to find it in any case of a syphilitic lesion is easily explained by the difficult technic of the necessary staining process, and the difficulty of detecting it in the fresh specimens. The matter has been taken up in America by Drs. Simon Flexner and Hideyo Noguchi of New York, their study comprising a small number of cases of recent syphilis and two cases of non-syphilitic ulcer of the penis. In three out of four of the former the organism was obtained in the stained specimens, while, curiously enough, in the fourth where it was not found in the stained specimen it was observed in the fresh one. Metchnikoff and Roux have also obtained the same organism in acquired syphilis in man and in experimental syphilis in monkeys. Levaditi and Buschke and Fischer have taken up the matter in connection with congenital syphilis, and have found the organism in the pemphigus bullæ and papules of the skin, and in cases coming to autopsy in films from the liver and spleen.

The organism is described as follows: In length the spirochæta varies from four to ten microns, the average being seven microns; in width the variation is from immeasurable thinness to ½ micron. The number of bends is from three to twelve. The organism agrees in motility with the spirochæta rather than the spirilla; there are three characteristic movements; rotation on the long axis, forward and backward motion, and bending of the entire body. There are indications of an undulating membrane, but none of flagella. The poles end in sharp points.

Still more recently John Siegel, of the Zoological Institute of the University of Berlin, reports the discovery of a flagellate protozoon which he considers the specific cause of syphilis. The name *cytorrhyctes luis* has been given to this organism, and F. E. Schulze, director of the Institute, states that the most striking pictures are obtained about three weeks after the primary inoculaion, with the parenchymatous juice of the kidneys from thoroughly infected apes and rabbits. He describes the organisms as actively motile, flagellated bodies, measuring from 0.5 to 2.3 microns in diameter. The larger forms appear as laterally somewhat flattened, pear-shaped bodies, provided with a single flagellum at each end, whereas in the smaller forms a flagellum appears at the tapering end only. The larger forms show two distinct, round nuclei, the smaller bodies from four to sixteen.

ACUTE GASTRO-ENTERIC INTOXICATION.

With the recurrence of the heated term, pediatricians are again confronted with the problems of summer diarrhea which fails not of its customary prevalence during the months of July and August. Although all varieties of diarrhea become more frequent during the summer months, it is the morbid entity known as "summer diarrhea" which becomes especially prominent. Particularly in the large cities, the epidemic begins in June, increases rapidly, reaching its maximum in July, then diminishes during August and September, coming to an end in October. According to Seibert, to start the epidemic there is required an average minimum temperature of about 60° F. Cases do not begin to appear until this temperature has been sustained for an appreciable time. Then the epidemic begins and rapidly increases. July almost invariably presents the highest mortality. This is not to be attributed to the slight rise in mean temperature over June, but rather to the fact that the more susceptible infants are unable to withstand the first hot weather, and go down in a body at this early stage of the epidemic, leaving the stronger ones to fill the statistics of the later months in more distributed order. At one time heat was considered a direct etiological factor in the production of this disease, and there is no doubt that the higher temperature may cause a lowered vitality and interfere with the digestive functions. The overfeeding practiced by unintelligent mothers in a mistaken effort to satisfy the thirst of the child, which they mistake for hunger, contributes largely to the same result.

The disease is now universally recognized as of bacterial origin. The development of this view of the question and the subsequent antitoxic experiments are matters of recent familiarity to the profession. The predisposing factors are an age under two years, congenital debility, unsanitary environment and a condition of general malnutrition consequent upon unwise feeding. This last item is by far the most important of local causes, since the decomposition of undigested food furnishes a fertile medium for bacterial development.

While heat and dentition were regarded as direct etiological factors, prophylaxis was hampered, but the recent clearer conception of the causation has greatly extended the preventive field. Any effort to minimize the mortality from this disease must consider first a more effective sanitation, particularly in the cities. The children should be given a maximum of sunlight and air, and should be kept scrupulously clean. Where such is possible, children should be sent to the country during the heated months, and those less fortunate should be kept in the parks, on the recreation piers and similar breathing places as much as may be. Much has already been done in this direction, and even while we recognize that many of the children of the cities are necessarily living in unfavorable surroundings, we must also recognize that even under such circumstances there are many prophylactic measures which can be taken by the mothers if they are educated to the point of realizing their importance. These are, the regularity of feeding, dangers of overfeeding, some process of sterilization where artificial feeding must be resorted to, the diminishing of the food and increasing the amount of water given during terms of excessive heat, and an attitude of watchfulness for mild intestinal derangements.

ABSTRACTS

Nervous Diseases of Children and Their Relation to School Life and Work.—Dr. John Punton (Kan. City Med. Index-Lancet), states that all the nervous diseases of children belong to one of two great classes, viz.: (1) Organic and (2) functional diseases. The former comprise the more serious and permanent nervous diseases of children, and their presence usually precludes the attendance of the pupil at school, so that as a rule they are not commonly seen in the school-room.

The functional disorders, however, including such conditions as headache, neuralgia, St. Vitus' dance, hysteria, epilepsy, so-called nervous prostration and feeble mindedness or dementia, are more commonly found associated with school life and work. The nervous system in the normal child is constantly undergoing marked changes both in *its structure and function,* but the former is much more rapid in its development than the latter. For instance, it is now a well-known scientific fact that while the brain at birth is the most immature of all the great organs of the body, yet at the age of eight years it has attained at least ninety per cent. of its full weight. Hence the brain of a child at the age of eight years is almost as large as that of a full grown adult; yet the normal relative power and capacity of each ordinarily differ enormously, and are usually in proportion as the individual is influenced by the varying conditions of heredity, environment, education and other features associated with modern civilization.

The extreme slowness, however, of the brain cells to attain their fullest power after it has reached almost its full bulk in weight, is one of the most remarkable features of nervous evolution, and in this respect the brain differs from any other organ or tissue of the body. For it takes the brain cells the enormous time of eighteen years to attain their highest functional development. And this exceptional law of physiology should always be borne in mind by the officers and teachers of our public schools.

Moreover, we must remember that the highest activity of the brain cell is the faculty of restraint or inhibition, which in common parlance corresponds to the term self-control. Now this power is not only the last of the mental forces to be developed in the successive stages of nervous evolution, but is also the highest of all the powers of the mind, hence the importance of its proper development cannot be overestimated. Moreover, this power of self-control is perfected at different rates and degrees at different ages, and no two persons possess exactly the same amount of self-control at the same age, but attain this in graduating proportions according as they are influenced by conditions of heredity, environments, education and other agents referred to. When, therefore, we watch carefully the growth and development of children, we observe that some have the sense of self-control developed much sooner and much stronger than others, while many seem to be almost destitute of this important mental attribute.

Moreover, this power of self-control is contemporary with the individual's choice of right or wrong, which is again synonymous with the term conscience. Now, we all know that the power of choosing the right and avoiding the wrong, or the conscience sense, presents every degree of development in the child, and even after reaching adult life some are found to be wholly devoid of any conscience. This is notoriously the case in those whose ancestors for several generations have been criminals, insane or drunkards.

In some children, however, we find the sense of right and wrong abnormally developed, owing possibly to faulty methods of tutorship or inherent causes, in which case it may present one of two extremes, viz.: an *undue sensitiveness* or an *abnormal degree of dullness;* for instance, when abnormally sensitive the desire to follow the inclinations to do right and avoid the wrong becomes a severe nervous strain or painful effort. As an illustration of this, Dr. Clouston, in his work on "Mental Medicine," says he knew a little boy four years of age who, by dint of constant rigid tutorship on the part of his mother, became so very sensitive as to what was right and wrong that he never ate an apple without first considering the ethics of the question whether he should eat it or not. He would suffer acute misery, cry bitterly and lose much sleep at night if he had shouted too loud at play or taken more than his share of the cake at supper, he having been taught that these things were wrong and displeasing to God. On the other hand the child may lack the fundamental instincts associated with right and wrong, and will take to stealing, lying and cheating, as ducks take to water, in spite of all teaching. Hence we find the conscience sense may be either hyperesthetic or anesthetic, in which case the conscience becomes seared.

Such abnormal conditions are often due to hereditary defects, bad environments, defective family training, and faulty methods of education. These various weaknesses, however, of children, from whatever cause, are in large measure subject to the proper development of mental inhibition, or the faculty of self-control, which, as before remarked, is slow and gradual in attaining its highest state of developmental perfection, but when unduly stimulated or allowed to become unrestrained, from any cause, defective inhibition or loss of self-control with subsequent impairment or lowering of the child's conscience sense is the inevitable consequence. Moreover, these weaknesses are also expressed in the form of nervous disorders, which in their more serious aspects may be associated with criminal tendencies—indeed that vast increase of juvenile criminology in our city can be directly traced to the varying lack of development of the power of self-control. Modern medical science also demonstrates that the cultivation, preservation and maintenance of health depends almost entirely upon the influence exerted by the nervous system upon the general bodily organs. There is, however, good physiological reasons to believe that there is a marked disproportion normally in the child between the power of restraint by the sensory cells of the brain and those of motion, which render the average child peculiarly susceptible to excessive motor activity, and unless this is judiciously guarded it easily leads to the development of nervous diseases which have for their chief symptoms an excess of motion which are expressed in the form of convulsions, hysteria, St. Vitus' dance and epilepsy, all of which are commonly associated with school life and work. Hence, every child is normally predisposed to excessive motor activity, as the sensory restraining forces of the brain are not sufficiently developed to assume full control until a later period of life, and this lack of restraint or self-control in the child forms a very important factor in the production of functional nervous disorders, as well as criminal tendencies. Moreover, such conditions, when neglected and allowed full sway, also retard the physical and mental development of the child by interfering with the normal process of nutrition, resulting in an impoverished condition of the blood, which constitutes the basis of so many nervous disorders. All education, therefore, should be based upon an intelligent recognition of these physiological laws of growth and a sympathy, as well as a proper adaptation to them. The natural law of progressive physical development is as gradual in its operation as the growth of trees and flowers, and if during the formative period of a child's life the various bodily organs, and especially the functions of the brain, are unduly pushed or stimulated, its powers and capacities will never be brought to the highest state of development of which they are capable. In a well developed human organization the aim should be to have the normal equilibrium of its every force perfectly balanced, and to use the words of an eminent medical psychologist, "there should be no power in a higher nerve center to compel a lower one to do more than it is psysiologically fitted or capable of doing, for, when this is done it is similar to 'whipping a tired horse up a steep hill.'" The fatigue following the normal use of the faculties of the mind should be absolute in themselves to compel periods of rest, but when overfatigued or strained from any cause they lack this normal power of adjustment, and the pupil suffers from insomnia, headache, fidgets and other symptoms of general nervousness. That the instruction of children to-day is conducted largely on business principles, which pays little regard to physiological strength and capacity of the pupil is well known.

Hence the largest amount of knowledge is to be acquired in the shortest time possible, and the teacher that is most in demand is he or she who can extract the greatest amount of brain tension during the allotted hours of study. Intellectual achievement is the goal all are seeking irrespective of sex, age, mental or physical capacity, thus ignoring the significant law of physiology which teaches "that within certain limits the growth of an organ is in proportion to its exercise, while all excess is attended with corresponding loss of power and diminished capacity." The practical significance of the physiological principles already referred to when applied to the pupils of our public schools cannot fail to appeal to every teacher, more especially when we come to consider their relation to the chief causes of the more common nervous disorders of children that are found associated with school life work.

While the diseases themselves are not specifically numerous their causes are subject to indefinite expansion and wide variation, but there are a few causative factors which loom up above all the rest like mountains from the plains, and it is these that I desire more especially to emphasize because they are to a very large extent subject to the laws of prophylaxis or prevention, and consequently within our power to relieve and even arrest.

All authorities agree that the most conspicuous and important cause, and that to which all others are subservient in the production of the nervous diseases of children, is the transmission through successive generations of that peculiar bodily condition we term the *nervous constitution* or *temperament.*

This manifests itself by a general restlessness or unstable condition of the nervous system, which makes itself felt by a constant nervous weakness or tendency to break down under the most trifling circumstances, thus affecting the emotional attributes of the individual, and gives expression in the form of abnormal states of feeling and nervous irritability, which corresponds to that condition known as the nervous constitution.

These abnormal conditions of inheritance often come as a result of imperfect growth, defective nutrition, incorrect habits, injudicious education, and modes of life of the parents, the general effects of which tend to lower their general standard of health, while the morbid products resulting from such evils are readily transmissable from parent to child in the form of certain nervous tendencies, and what in the offspring is recognized as the nervous constitution.

Unfortunately the same causes which produce the impaired health or nervous conditions of the parent are often allowed to have fuller sway in the child already predisposed, and then a still more serious breakdown is liable to occur. Children born of such neurotic parentage therefore inherit a weakness from the start, and as growth and development take place, unless judiciously guarded by both parent and teacher, we find them peculiarly liable to break down and suffer from the various forms of nervous diseases, more especially during the educational period, as well as the physiological crisis of their lives. This nervous constitution or so-called nervousness may not only be inherited but also acquired, and the person born of healthy parentage can by the excessive use and abuse of certain agents, such as tobacco, alcohol, opium, acute illness, injudicious methods of education, accidents and injuries, together with physical and mental strains, and excesses of all kinds, produce this very distressing bodily ailment. Hence it may be both congenital and acquired and assume all degrees of seriousness. Moreover it is also important to remark that females are more susceptible to its pernicious influence than the male sex, owing to their finer emotional sensibilities, and as growth and development take place when subject to this bodily weakness are peculiarly susceptible to all kinds of impressions both mental and physical, which unduly impress themselves upon their more sensitive nervous organization, giving rise to morbid neurotic disorders.

In spite, however, of popular belief and public opinion that hereditary taints are necessarily incurable, we can in the light of modern medical science certainly declare that morbid inheritance is not, in the vast majority of cases, a mysterious and necessarily fatal doom, certain at some time or other to overwhelm its victim, but can be remedied and even cured when judiciously medically guarded, and, therefore, loses half its horror when this important fact is well understood. Next to the powerful influence exerted by *heredity* in both the proportion and spread of nervous disease, the most potent factor in the causation of nervous disorders of children are the various *disturbances of the emotions incident to the formative period of life.* These include such conditions as grief, fright, disappointment, mental worry, bad family training, faulty modes of life, injudicious forms of education, lack of exercise, and shocks to the nervous system, due to slight or serious injuries. Such causes are also emphasized by the presence of the common infectious diseases of children, like measles, scarlet fever, diphtheria, rheumatism and other poisonous agents, as well as the various stomach and bowel disorders, including dentition, eyestrain and other reflex irritations. The special tendency, however, of all these various causes is such as to produce morbid changes in the blood, which are usually expressed in the form of anemia or badly nourished physical and mental conditions which underlie the vast majority of the nervous affections of children.

Modern medical science demonstrates conclusively that the mental health of the child depends almost entirely upon the development of the physical organism, and that the physical deterioration of the child from any cause is the responsible agent for much of the nervousness now so very prevalent in the pupils of our public schools. Hence a large number of our school children, by virtue of their bad heredity and neglected or careless modes of home training, are found to be not only neurotic, but pitiably weak and anemic, and suffer from the various conditions of malnutrition. They are, therefore, poorly nourished and found far below the normal standard of physical development. Indeed, their nervous systems are in such a weakened state as to practically render them wholly incapable or unfit to accomplish the actual work of each grade or class, and when subject to undue stimulation, or pushed in their studies by either teacher or parent, they soon show signs of nervous weakness, which later gives expression in the form of headache, vertigo, spasms, neuralgia, St. Vitus' dance, hysteria, epilepsy, nervous prostration, and even insanity. Herein lies one of the most serious evils of our present school system, which pays little regard to the constitutional differences and defects of its pupils, but has organized its means and methods so that each school can yield a good average "mill product."

Every teacher is compelled to recognize that there are pupils in the class that lag behind, or fail to grasp the elementary principles of education like the larger majority of children, and that such pupils are difficult to manage. When subject, however, to medical inspection such children are often found to be suffering from faulty nervous organizations, due probably to nutritional defects which may be accompanied with abnormal reflex action, such as eye-strain and neurosis or a nervous fidgety state which causes them to squirm in their seats and pay little attention to their studies. Many a child is unconsciously punished in various ways by the officers and teachers of our public schools for failure to perform tasks for which it is wholly unfitted, and in order to maintain the strict form of school discipline are often refused favors which their condition justly demands as the result of irresponsible nervous defects. More especially is this true of females when nearing the critical period of puberty, and males during the transitional stages from youth to manhood.

It would be most unfair if the prevailing methods of the public school system of America were accused of being the sole cause of the marked increase of the nervous disorders among children. But while this is not true there is no doubt that it can justly be charged with imposing too heavy burdens upon those who are by inheritance or other causes both physically and mentally unable to cope or compete with those children of more favored ancestry and physical development. As physicians we cannot, of course, change the child's ancestry, or perhaps home training, but we can speak out against the crime of pushing children with hereditary physical defects to rapid brain development which accentuates existing nervous tendencies until they culminate in actual nervous disorders.

Modern medical science demonstrates the scientific fact that the mental output of the pupil is directly related to height, weight, and physical measurement, and that there is a physical basis for precocity on the one hand and mental dullness or feeble mindedness on the other.

The trend of modern medical teaching therefore implies that the prime necessity in our school children is to have plenty of bone, blood, and muscle; in other words, to be well developed physically even if it be at the expense of their education, for there is no doubt that we too often sacrifice the constitution for what we term educational necessities. Medical science also teaches us that children of nervous constitutions should be kept fat from birth, and when they arrive at school age their brains should not be forced. As a general rule these nervous children are precocious and hypersensitive, possessing a vivid imagination and keen perceptive qualities. Hence they are recognized as being smart and intelligent—the brightest pupils in the class, and pushed forward to their fullest extent in the hope that they may outdistance all other competitors.

The evil resuls, however, to the nervous system which follow such false methods are too well known to the physician to be lightly regarded, as such children invariably succumb to the well-known law that teaches us that precocity is a sure sign of biological inferiority, and should therefore not only be discouraged, but also condemned in spite of the apparent educational advantages or promised intellectual rewards. There is a wide-spread fallacy which unfortunately is relied upon so often to the detriment of all parties concerned that it has become almost a public crime, the idea that *the child will outgrow its nervousness* and consequently there is no cause for alarm when a child suffers from the various forms of nervousness or weakness. Such teaching is absolutely false, and contrary to all medical knowledge and experience.

In spite, however, of such foolish doctrines, modern medical experience demonstrates that nervous diseases are very real in their character, and in their incipiency are more curable than at any other time, and when neglected culminate in serious permanent disabilities. Such an occurrence as a fainting attack or a mild spasm, or even convulsion should therefore not be considered such a trifling affair as it may be the initial warning of an oncoming epilepsy or hysteria.

A brief glance at the symptoms which accompany the functional nervous disorders of children demonstrates them as representing either an increase, decrease or perversion of the functions of the nervous system involved in the morbid process. Hence we find that they largely pertain to disturbances of motion, sensation, reflex action, the mental faculties and the visceral organs, all of which are more or less dependent upon nutritional defects. For instance, the chief disturbances of motion are seen in convulsions or spasms, tremors, and the various forms of paralysis, a combination of which so often accompany such diseases as St. Vitus' dance, hysteria and epilepsy. Perhaps the chief disturbance of sensation is expressed in the form of *pain,* which may present itself in all degrees of intensity, and if *pain* is what we are told it is, viz.: "The prayer of a nerve for healthy food," we can readily understand the origin of such conditions as headache and neuralgia. The mental symptoms present quite a variety of morbid manifestations, but the principle ones perhaps are dizziness, fullness of the head, morbid fears, despondency, mental apathy, hilarious excitement and even delirium. These are commonly associated with disturbances of the visceral organs, due often to either too much or too little food coupled with an excess of candy or other confectionery, the resulting symptoms consist in indigestion, flatulency, palpitation, biliousness, constipation, nausea and vomiting, with all degrees of fever and general malaise. The nutritional symptoms are seen in either anemic or congestive states, as well as all degrees of exhausted or wasted conditions of the body. Such children are usually thin, pale, and badly nourished, yet are often mentally precocious and quick-witted, besides highly sensitive to all kinds of impressions as well as suggestions, both mental and physical. They are of all children the most liable to break down under the stress of the educational period. Occasionally we find the nutritional defects presenting the reverse of these conditions, and a few may be found suffering from abnormal blushing or mild congestive states, as well as skin eruptions which, when confined to the face, prove a source of great annoyance because of their misleading character.

While writing this paper the report of the medical inspection of the public schools of New York for the year 1904 came to hand. Its perusal shows that during the past year no less than 41.826 children were found suffering from the various contagious diseases. So far the medical inspection of schools has been largely limited to the detection and prevention of contagious and transmissable diseases among the pupils, and while this is a step in the right direction and deserves every encouragement, yet I am certain that if we hope to overcome the present physical deterioration so prevalent among the children of our public schools and its consequent nervous tendencies, we must of necessity adopt other measures than those now being enforced. Indeed, no intelligent person can read this report of the New York medical inspectors without being convinced that while much is being accomplished for the public good, much still remains to be done in order to overcome such public evils. Among the conditions over which the inspectors claim they now have no control is the exclusion of all nervous diseases from class attendance, and the separation of children with inferior mentality. In my judgment, however, a very important agent and one which so far has largely been ignored in the prevention of nervous diseases of children is the enforcement in our public schools of the principles embodied in the science of anthropometry.

What seems necessary, therefore, in order to help overcome the physical deterioration that now underlies both precocity and mental dullness, as well as other nervous conditions, is to fix certain definite standards of weight and measurements for every age and height, and any pupil found to be above or below this fixed standard should be placed in specially arranged classes. It is possible that such a method might work harm to the few, but the greatest good to the greatest number must and should always be the principle upon which our public school system should be governed, and the method suggested would certainly obviate many existing evils.

Moreover, the practical utility of such a method has already been demonstrated by Dr. Dudley Sargent of Harvard University, and Dr. Seaver of Yale, both of whom highly commend its practical utilization in the public schools.

Appendicular Pain in the Pneumonia of Children.—Cavatorti (Archives of Pediatrics) reports the case of a girl aged 10 years, who was seized with all the symptoms of appendicitis, and in two days later developed pneumonia. During the pneumonia the pain did not disappear entirely, and some of it remained even after the pneumonic process had resolved. Praudi thought that the abdominal symptoms were due to ordinary intestinal disturbances, which are so common in children. Cavatorti, however, considers the intestinal pain in this case to be due to the specific germ of pneumonia, the bacillus of Fraenkel. In other words, there was an appendicitis due to the same germs that produced the inflammation of the lungs.

Lobar Pneumonia in Children.—Marion McHull (American Medicine) directs attention to the greater frequency of this variety of pneumonia in children than is ordinarily supposed, and the characteristics of the childhood type—its greater tendency to begin without a chill and to terminate by lysis; for resolution to be delayed and to be followed by abscess of the lung or empyema; and the greater frequency of otitis as a complication on account of the anatomical peculiarities of the Eustachian tube in children. Otitis has occurred in 59 per cent. of the author's cases, in many without pain. Difficulty of early diagnosis is characteristic. The degree of leucocytosis may be of value in determining the prognosis.

Relation of School Methods to School Diseases.—W. J. Herdman, Ann Arbor, and J. H. McBride, Passadena, reported for the committee appointed at the New Orleans session of the American Medical Association (Journal A. M. A., Apr. 15). They gave an account of what has been done here and abroad in the way of school inspection and isolation of diseased children and general sanitation of school buildings, the special care of backward children, etc. The report approves of the thorough psychologic examinations made in the Chicago schools as the high-water mark in school inspection in this country and elsewhere. It finds the work satisfactorily done in a few places, though as yet inspection methods are far from complete in most communities, and in some they have never been tried. The report recommends that the American Medical Association put itself on record as urging complete and systematic medical inspection of schools and school children: "1, in the interests of the public, since it is a potent means for detecting and preventing the spread of contagious and infectious diseases; 2, for the purpose of securing to the child, while in attendance on school, the most favorable hygienic and sanitary conditions; 3, for the purpose of securing exact knowledge regarding the physical and mental capacities of each child, in order that the methods of instruction may be intelligently directed to meet individual needs."

Reaction of Colon Bacillus Toxin.—The action of the intracellular poison of the colon bacillus, the extraction and characteristics of which were described by Dr. Wheeler, has been studied by V. C. VAUGHN, JR., of Ann Arbor, Mich. (Journal A. M. A., April 29). His conclusions are in substance as follows: 1. The colon bacillus produces a powerful poison when grown on artificial media. 2. It is intracellular in character and contained in both the living and the dead bacterial cells. 3. It can be separated from the other constituents of the cell only by chemically breaking up the latter. 4. The peritonitis occurring after intraperitoneal inoculation with the colon bacillus is due to the presence of the poison in a combined and not in a free state. 5. This intracellular poison causes a marked fall in body temperature. 6. The poison of the colon bacillus apparently causes death by paralysis of respiration. 7. The intracellular poison is an essential group of the bacillus, and can be built up synthetically on proteid free media. 8. It is the poison causing death in animals inoculated with cultures of the living colon bacillus.

The Etiology of Gastroduodenitis in Children. — JOHN ZAHORSKY (St. Louis Medical Review, Feb. 4, 1905) says during the last six weeks cases of gastroduodenitis and catarrhal jaundice in children have been so numerous in St. Louis as to suggest an epidemic. Inquiry among other physicians only tends to strengthen me in my belief that we have had a widespread epidemic of gastroduodenitis, and it might be profitable to inquire into the etiology. Ever since Kehr reported an epidemic of this disease, considerable interest has been shown in its possible infectious origin. Many such epidemics have since been recorded. Kissel and Neumann insist on the infectious origin of this disease since studying epidemics, but Henoch, in his last lectures, cannot bring himself to accept this etiologic relation. In view of the increasing number of epidemics and the occurrence of many cases which are characterized by fever and its attendant symptoms, the infectious theory is sure to become popular. It has long been known that catarrhal jaundice occurs most frequently in autumn or spring, and that when one case is seen, several others are likely to be encountered, but not until epidemics, showing the characteristics of the infections in severity and extent, have been reported do we begin to recede from our old position. One of the most interesting of these epidemics was reported by Pomeroy (Boston Med. and Surg. Journ., Aug. 4, 1898). This was an epidemic of 675 collected cases near Calumet, Mich. It was distinguished from Weil's disease by its more gradual onset, the later occurrence of jaundice, and its mild character. Yet several patients died with septic symptoms. The disease seemed to be distinctly contagious, since several members of a family were often attacked. Peck (Brit. Med. Journ., Dec. 7, 1901) has given a very interesting account of epidemic catarrhal jaundice in Derbyshire, England. He insists that the disease is contagious. Indeed, there are some observers who find increasing evidence that all forms of infectious jaundice should be classed under one head. Thus Washburn (Medicine, 1890) considers malignant jaundice, Weil's disease, epidemic jaundice, and acute yellow atrophy as various grades of the same disease. Kissel observed ninety-six cases of infectious icterus in children ranging from one to fourteen years, in the course of six years. A few cases were so mild that they might have been catarrhal icterus; but he does not recognize any distinction between the two classes, regarding them as only different grades of the same disease. Peck has by examination attempted to throw a light on this subject, and his work strengthens this position, so that Monti is inclined to assume even a specific origin of all cases. Passing to the bacteriological studies, the only one of importance is by Jager, who found a bacillus which belonged to the proteus group, which he named "Proteus fluorescens," and which seemed to have an etiologic relation to Weil's disease. It is very questionable whether colds or emotions, as some writers have reported, have anything to do with the causation. The unusual occurrence of jaundice during the season when gastroenteritis is common proves that the ordinary bacteria and toxins connected etiologically with summer diarrheas have nothing to do with the autumnal gastroduodenitis. It is not an intoxication from milk, neither is it possible except in a few instances to find dietary errors. He had treated about a dozen patients suffering from gastroduodenitis during the last few weeks, about half of whom also had catarrhal jaundice. The ages of the children ranged from two to fifteen years. It is probably a peculiar incident that most of the cases were in girls, and all my cases of catarrhal jaundice were in the female sex. These cases were seen in all parts of the city, so that locality seemed to have no relation to the cause. Most of the patients attended school, but only two of them attended the same school. Only in one instance were two cases found in the same family, and in neither of these was the disease followed by jaundice. It could not be said, therefore, that the disease was contagious. In only one instance a history of imprudent eating was obtained, the girl having eaten very heartily of fresh pork a few days before the onset of the vomiting. In most cases the onset was sudden, but three girls gave a history of prodromal symptoms lasting about one week. The infectious nature of the disease was especially suggested by the attendant symptoms. In three instances fever was a prominent symptom, but only in one of these was there jaundice. A brief history of this case may therefore be instructive. M. S., female, aged seven years, during infancy suffered from spasmodic pyloric stenosis, which caused great emaciation, and for the first year she was a very frail infant. After this she gained rapidly and had no more trouble with her stomach. She suffered from several attacks of sore throat during her life; she also had influenza and measles. She had not been feeling very well for a week or more. The night before my visit she began to have fever and commenced to vomit. This vomiting became very severe. She suffered from thirst but all water was rejected. During the night she was delirious at times and when she awoke she seemed dazed. When I first saw her the temperature was 103 degrees F. She complained of pain and tenderness of the epigastric and right hypochondriac region. With the exception of swollen and congested tonsils nothing abnormal was discovered. On the following night she was still very delirious and the temperature was elevated. She still vomited several times in spite of small doses of phenol, magnesia, and phenacetin, but on the following morning marked improvement was noticeable. The stools, however, were very light in color and the urine contained bile. Two days later the conjunctiva and skin showed the icteric hue. This disappeared in about one week. Three other patients had fever and all the attendant symptoms of gastroduodenitis but jaundice did not follow. In all cases enlarged and congested tonsils were discovered. This corresponds to the seven cases reported by Forchheimer, who had observed these congested tonsils in catarrhal jaundice. Most of the patients had a very foul odor from the mouth, which might be interpreted as an additional proof in favor of a proteus infection as this germ leads to a very foul putrefaction. Catarrhal jaundice has been noticed many times in cases diagnosticated as influenza, but in none of my cases could such a diagnosis be made, either in the patient or in other members of the family. Yet, in studying the infections of other members of the family, it was found that bad "colds," pneumococcus infections, were very common, and in two cases of gastroduodenitis, a bronchitis was a sequel. The association of pneumonia and catarrhal jaundice has many times been noticed. In fact there are many infectious diseases which stand as an occasional causative agent of catarrhal jaundice, but my experience seems to point to a special cause of this disease. Whether that belongs to the proteus or to some other micro-organism is uncertain. The occurrence of jaundice depends on the extent of the inflammatory process. The inflammation may be limited to the stomach and no jaundice, of course, will result. In severe cases the congestion extends through the pylorus involving the duodenum and common bile duct. From the gradual onset of symptoms in many cases the conclusion is justifiable that this inflammation gradually spreads over the walls of the stomach and thence into the duodenum, and is analogous to the extension of the catarrhal inflammation of the respiratory tract. The etiologic microorganism first gets its start in the tonsil and thence attacks the stomach.

He protests against the text-book assertion that the etiology of this disease is obscure; there are already sufficient data to point out the direction in which proper investigation may find the whole solution of the problem.

Severe Case of Chorea Successfully Treated by Apomorphin.—Dr. Tull (N. Y. Medical Journal) reports the case of a girl, fifteen years old, well developed, presenting appearance of mature woman; was of neurotic stock, menses irregular. Began to develop chorea when at boarding school. Outdoor exercises, arsenic and iron were prescribed but she rapidly grew worse until she was unable to stand. She was given veronal gr. 10, the three valerianates, opium by suppository; a pill containing morph. acet, camphor, English ext. hyoscyam and creasote, one every 2 or 3 hours; arsenic continued, 16 drops t.i.d. A specialist was called who could suggest nothing but more arsenic, pronouncing it the worst case he had ever seen. After some days, when the patient was still worse, she was given apomorphin gr. 1-40 hypodermically. Within three minutes the incessant motion had ceased, muscles relaxed and the child had fallen into quiet sleep. He then ordered gr. 1-20 by mouth every 3 hours, with arsenic as before. The improvement was steady and rapid.

Summer Diarrhea.—By Dr. C. G. Kerley (N. Y. Medical Journal). The author outlines the number of cases treated, mild and severe, and the number of days ill when first seen; the condition of child; number of passages in 24 hours; character of passages, whether watery, slimey, bloody or almost pure blood; the kind of food taken, its quality and frequency. He states that, out of 682 cases they had but 21 deaths. His method to try to secure a pure food and to make the contents of the intestinal tract as poor a culture field as possible. No matter how mild a summer diarrhea it should be treated promptly and energetically, as no one is able to tell with certainty the nature and extent of the lesions. At autopsy he has often found no lesions where grave ones were expected and in others extensive ulceration where the child has passed but little mucus and no blood and had died after very short illness. A case mild at the outset and which the physician often considers a mild case of indigestion, if fed on milk, will develop a violent intestinal infection. For diet no milk is allowed till stools are practically normal, even if for weeks. As substitutes are given cereal waters and gruels, preferably of barley and rice. If the child soon tires of this vary it by adding one or two ounces of broth to every five or six of the cereal water, using beef, mutton or chicken. But he cautions against too much broth lest it increase the diarrhea. Avoid brandy and whiskey on account of irritating stomach and kidneys. The white of egg he has discarded as it does not digest as well as the cereals. For medicine he first gives the child a dose of calomel, gr. 1-20 or 1-10 every half hour until 1 or 2 gr. are taken, if there is vomiting. Oil is preferred in absence of vomiting, especially if quick result is desired. After cathartic acts he gives bismuth subnit., gr. 10, every 2 hours, regardless of age. If it is not converted into sulphid of bismuth, as shown by failing to turn the stool black, and due to absence of pancreatic digestion, he adds sulphur, gr. 1, to each dose of bismuth. Opium is indicated with severe pain, tenesmus and frequent stools. When pain is not severe and the child has 4 or 5 foul movements daily, with fever and prostration, he gives laxative. Irrigation of colon is given every eight hours in cases with green mucus, with or without blood. He uses saline and, in case of blood, one per cent. tannic acid solution. If fever is high use water at 60 or 70 degrees. If temperature is subnormal or patient weak use it at 110 degrees.

Protective Power of Vaccination.—H. T. Neilson (Brit. Med. Journ.) reports a case of a mother, aged thirty-seven years, who was attacked with small-pox, and was taken to the hospital with her seven-months' old baby which she was nursing. The infant had been successfully vaccinated fourteen days previously. The baby was not weaned but was nursed by the mother throughout her illness (confluent small-pox) and was handled daily by about fifty other patients in various stages of small-pox. The child left the hospital in perfect health.

Tuberculosis and Infant Feeding.—Dr. E. Sobotta (Zeit. f. Tuberkulose u. Heilstättenwesen) says that the influence of the feeding of infants upon the later appearance of tuberculosis is a very important one. Many factors complicate the quesiton, such as heredity, constitution, exposure to infection, etc. The author has made extensive inquiries, and his results are as follows: Of 76 children who were suckled, 62 remained healthy and 14 became tuberculous at a later period. Of 57 sucklings who also were fed on cow's milk during the first year, 37 continued healthy and 20 were later victims of tuberculosis. Of 39 children who were fed during the first year on boiled cow's milk (bottle-fed), 23 remained healthy and 16 afterwards suffered from tuberculosis. Of 4 children fed with preserved milk, none suffered at a later period from tuberculosis. In these statistics the possibility of tubercular infection being conveyed through the mother is left out of the account. The nursing mothers were tuberculous in two cases only. All the wet nurses were healthy. If these two cases are excluded the results will be scarcely at all affected. The result shows that breast-fed children are less prone to form tuberculosis in later life than are those brought upon cow's milk or on a mixed diet. And the bottle-fed children were thus shown to be more susceptible to subsequent tubercular infection than are those brought up on a mixed diet. Hence it follows that the tendency to tubercular infection increases with the replacement of breast by bottle-feeding with cow's milk. If the first and last group are left out of account (breast-fed children and those brought up on condensed milk), the following percentages are obtained: Of 80 children brought up with cow's milk during the first year, 14, or 17.5 per cent., afterwards suffered from tuberculosis. Of 96 children brought wholly or partially on cow's milk, 36 afterwards became tuberculous, or no less than 37.5 per cent. These results are very striking, and bring out very distinctly the risks appertaining to bottle-feeding with cow's milk,

Appendicitis in a Child Discovered by Rectal Examination.—DAN MCKENZIE (Brit. Journ. of Children's Diseases; Med. Rec.) emphasizes the fact that rectal examination should be undertaken as a matter of routine in all doubtful cases of illness in children more especially in those in whom the symptoms point to the abdomen as the seat of disturbance. The writer reports a case in point: A boy, aged four years, was suffering from pyrexia and malaise when first seen. As he was subject to acute gastric attacks, nothing unusual was anticipated. On the day after the first examination, he complained of stomachache and pain on micturition. The abdomen seemed to be hard and tender. Per rectum, the bladder was felt to be full and fluctuating. As some cystic trouble was suspected, the patient was anesthetized and a catheter passed into the bladder, but nothing was found to account for the symptoms. Rectal examination cleared up the cause of the illness. Bimanual palpation of the pelvis and abdomen revealed an oval, rounded tumor about the size of a pigeon's egg, lying toward the right side of the pelvis, in the right iliac region. Appendicitis was diagnosed. At the operation, which was performed the same evening, it was found that the appendix was perforated in several places and the organ was lying in a pool of pus, so that if surgical intervention had been delayed even for a day or two, the child would doubtless have died. Convalescence was complicated by the passage of a fairly large uric acid calculus. After this, recovery was uneventful. The pelvis in a child is so much shallower than the pelvis in the adult that it is possible with a finger in the rectum to investigate the condition of the abdomen far more completely than can be done in later life. Anesthesia, in the writer's experience, is necessary for a satisfactory examination of this kind.

The Treatment of Eczema and Impetigo in Children.—C. W. ALLEN (Medical Record, May 20, 1905), says that although many cases of infantile eczema depend on improper feeding, and faulty digestion or assimilation, the majority are susceptible of cure by local measures alone. In general it may be said that symmetry of lesion speaks for constitutional origin, asymmetry for local cause. Among general local measures to fulfil the objects of disinfection, protection, soothing and favoring the growth of new epidermis, the use of methylene blue solution is especially advocated. A three to five per cent. watery solution is allowed to dry in well and a thin layer of collodion is quickly applied. Nitrate of silver in five to twenty per cent. strength, salicylic acid, resorcin, sulphur, ichthyol, etc., are also recommended and the indications for their use in different cases described. Impetigo contagiosa according to the author, is frequently associated with pediculosis capitis and in treating it the parasites should be sought for. Crusts are to be removed with potato flour poultices and ten per cent. ammoniated mercury ointment applied, or green soap solution followed by 1-1,000 bichloride of mercury. Ichthyol, salol, beta naphthol, sulphur and red sulphide of mercury are also useful in some cases.

Rheumatism of Childhood.—W. C. Hastings, M.D., (Northwest Medicine), says we are too prone in making our examinations of children to base our ideas of rheumatism upon the well-known symptoms in the adult, namely; severe pain, great swelling, high fever, scanty urine, etc., forgetting that a child with rheumatism may and generally does present a different array of symptoms; in fact, but few of the well recognized symptoms accorded to rheumatism may be present. So that, unless great care be exercised, we may not be aware of the real trouble until brought face to face with a serious valvular lesion. Well marked cases of rheumatism are very rare before the fifth year. However, he has seen a case in an infant only a few months old. Acute articular rheumatism is quite rare in children, but the other manifestations are very common and as frequently are overlooked or at least are too often passed by. Among these manifestations are growing pains, eczema, erythema, purpura, chorea, migraine, torticollis, gastralgia, anemia, tonsillitis and heart affections. When we have a case of acute articular rheumatism in a child, the swelling may be extremely slight, attended with but little redness and pain, and the fever may be very moderate. If this be the case with articular rheumatism, how shall we recognize rheumatism that might well be called the anarticular? Given an hereditary predisposition, attacks of tonsillitis, growing pains, easily fatigued, anemia, functional nervous disorders, namely: sleeplessness, irritability, erythema,—and you have a case of rheumatism. Malassimilation, growing pains and tonsillitis are very reliable sign posts. However, you may not have all these indications; there may be only a history of tonsillitis, with a very tedious recovery. Here we must not fail to examine the heart, or a dangerous endocarditis may be in full bloom before we are aware of it. Pericarditis, fibrinous, serofibrinous or purulent, sometimes attended with delirium, may occur; so also may myocarditis. One attack predisposes to other attacks, consequently these children need the very best hygienic care, for repeated invasions of rheumatism will assuredly produce heart lesions of greater or less severity. Always look upon "growing pains" and tonsillitis with suspicion. Likewise some skin diseases, erythema, eczema, etc., are of undoubted rheumatic origin. Night terrors and sleeplessness are sometimes offshoots also, as well as migraine and gastralgia.

There is one condition upon which he lays particular stress, and that is chorea. There is a difference of opinion as to the percentage of chorea cases that are rheumatic, but undoubtedly the great majority are engrafted upon that diathesis. The treatment is largely hygienic, avoiding as far as possible all conditions that have a tendency to aggravate and cause rheumatism. In regard to diet, the concensus of opinion is that "rheumatic children do much better upon a diet composed largely of nitrogenous food and that the sugars and starches should be restricted in amount. Milk should be freely given in all cases" (Holt). The remedies given should meet the particular condition in which the rheumatism manifests itself. Those usually indicated are the same as in adult life. Thus we have for the more acute cases sodium salicylate, oil of wintergreen, salicin and salol. Alkalies are indicated particularly in those cases where there is a hyperacidity of the urine. But subacute cases are often little or not at all influenced by the salicylates and the alkalies, and here we have to depend on the use of general tonics, as iron and cod liver oil. In order to protect the heart during a rheumatic attack absolute rest and an equable temperature for the patient must be insisted on and procured. For chorea of rheumatic origin we have the salicylates and cimicifuga racemosa, of which give the fluid extract, ten to fifteen drops in water, three times daily. While in the non-rheumatic cases of chorea we have arsenic—Fowler's solution—the most valuable remedy we possess.

Ocular Manifestations of Gonorrhea.—Hiram Woods, M.D. (Maryland Medical Journal) says that Credé's method is the accepted form of prophylaxis against ophthalmia neonatorum. The method consists in dropping between the lids of the infant a single drop of a 2 per cent. solution of nitrate of silver from a glass rod. Information obtained in Baltimore institutions demonstrated that the safest way is to use it as a routine in all hospital and dispensary confinements.

The facts that nitrate of silver is a caustic, that it is an irritant; that lid edema and conjunctival catarrh, sometimes of stubborn nature, frequently follow its use in the tender eyes of infants, and, further, that a very few cases of serious and one or two of fatal hemorrhage from the conjunctiva have been reported, have led to attempts to substitute some other agent. But the most interesting question at present is the comparative prophylactic efficiency of nitrate of silver and the new silver salts, protargol and argyrol. Argyrol, Edw. Jackson thinks; will, on account of its lesser irritating qualities, attain greatest popularity. In Baltimore at the University of Maryland argyrol has been used in the indoor and nitrate of silver in the outdoor departments, with the showing in favor of the old remedy. Again, the figures given by Drs. Williams, Dobbin, and Rowland, who used the nitrate in all cases, indicate results, in Williams' report, just as good as were obtained at the University of Maryland by argyrol. In the other reports the percentage of cases with the nitrate was smaller. So, from local experience, admittedly small, it seems that the old remedy is superior. Dr. Arnold Knapp of New York, writes: "At the Sloan Maternity Dr. Craigin tells me that they are perfectly satisfied with the substitution of 10 per cent. argyrol as a prophylactic, preferring it to protargol. It is as efficacious in their experience and much less irritating." No figures are given. At the Boston Lying-In Hospital Dr. Furrer, house physician, writes that up to a few months ago a 2 per cent. protargol solution was used, but that for nearly a year a 25 per cent. solution of argyrol has been employed. They have not had a severe ophthalmia in the indoor service for a long time, but occasionally have a case in the out-patient department.

Dr. Hirst of the University of Pennsylvania, says: "I use nothing but argyrol as a preventive treatment of gonorrheal ophthalmia. "Since using argyrol in a 25 per cent. solution I have diminished the proportion of ophthalmia cases in the hospital to between 1 to 3 per cent. of the infants born out of a total service in the hospital and dispensary of 900 to 1,000 cases a year. Without looking up the records, which would take considerable time, I should say we had less than a third of the cases of ophthalmia with argyrol than we used to have with nitrate of silver as a preventive treatment, but this may be a mere coincidence, as we have only been using argyrol a couple of years."

Thus in Baltimore, where alone figures have been obtainable, the showing is decidedly in favor of the old remedy. On the other hand, in three large services argyrol has supplanted the older remedy, and is regarded as equally reliable and safer because freer from irritation. The author is inclined to agree with Dr. Hirst in the importance he attaches to the irritative effects of the nitrate. Argyrol does not produce these effects, and there is not the same necessity of exactness in dosage. These "irritative" cases are not very common, and while disagreeable and tedious, are not dangerous. To the author it seems unsafe, in order to lessen the danger of their occurrence, to give up a remedy which, from statistics, has greater preventive efficacy. Concerning treatment, the most important thing is to get hold of the case early. As is well known, nitrate of silver has been the chief therapeutic agent in the treatment of ophthalmia neonatorum for many years. On account of its irritative qualities it has doubtless produced in not a few instances thickening of the lids and deep congestion which have aggravated otherwise mild cases. Arlt has urged the systematic examination of the pus for the gonococcus before employing the nitrate of silver, and the use of this remedy only when the organism is found. Since we have had argyrol, which seems to be free from the caustic and irritating qualities of the nitrate, we do not, so far as the author's experience goes, see so many of these cases, which, without impairment of the cornea, drag themselves along through weeks or months. Is argyrol as efficacious in curing the disease as is nitrate of silver when its gonorrheal origin is certain? This important question seems to have been conclusively answered by Dr. Myles Standish of Boston in a paper presented in June, 1904, to the American Medical Association and published in the Association's journal December 17, 1904. Dr. Standish insists upon all babies brought to him being left in the hospital. He has isolation wards with special nurses. His method of treatment "consists of washing the lids with a solution of boric acid once in half an hour, to put when necessary a little vaseline along the lids to prevent them sticking together, and to instil a solution of protargol or argyrol freely between the lids at interval from every hour to once in four hours." He does not employ any method of removing the pus mechanically from between the lids. Apparently he regards, as does Dr. Woods, the old method of wiping the pus from between the lids with cotton on the end of a probe or toothpick as a very dangerous procedure. No case is discharged from the hospital until two cover-slip preparations have demonstrated the absence of the gonococcus.

At the Presbyterian Eye and Ear Hospital protargol, from 2 to 20 per cent., and argyrol, from 10 to 50 per cent., have for the past two years been used in the treatment of gonorrheal ophthalmia. The author has not lost a single eye with clear cornea on admission with either agent. His entire experience in the loss of eyes in ophthalmia neonatorum amounts to two cases. Both occurred several years ago. They were treated with nitrate of silver. De Schweinitz (personal letter) is of the opinion that "nitrate of silver, properly applied by skilled hands, properly neutralized, with all caution that it shall not injure the corneal epithelium or that the corneal epithelium shall not be injured during manipulation, is just as efficacious as the newer salts, but more disagreeable." Comparing protargol and argyrol, the author has been much better satisfied with the latter. In a certain number of cases protargol seemed just as irritating as the nitrate. The irritative qualities of this remedy are very variable. Sometimes it causes no pain, and again a great deal. He could not see that it shortened the cases materially. He used 10 per cent. and 20 per cent. solutions.

But he is sure that argyrol does shorten the cases. He has never seen it cause irritation, and has used it as strong as 50 per cent. A case recently under care illustrates its prompt action. A baby with gonorrheal ophthalmia was brought to his clinic on the 3d of February. The lids were edematous, discharge profuse. Twenty per cent. argyrol solution applied every four hours put a top to the discharge in three days. Then, by way of experiment, the silver solution was discontinued. In three more days the eyes were full of pus. Argyrol was again employed, and in 48 hours edema had largely disappeared and the discharge reduced to a few drops. This case illustrates the truth of Standish's contention that treatment must not be discontinued until the gonococci have disappeared. Of 14 treated in the spring of 1904, nine were infants; one child was seven years of age. The strength of the argyrol solution varied from 25 to 50 per cent., the latter being employed only two or three times a day, and the former more frequently. Gonorrheal infection was proved in each case. All were admitted with clear cornea and all recovered. The shortest period of treatment was 4 days, the longest 16 days. This is a great saving of time as compared with nitrate of silver or protargol. The author thinks we are justified in concluding that in ophthalmia neonatorum argyrol is just as efficient as either nitrate of silver or protargol, less irritating than either, and saves a great deal of time and pain.

Spina Bifida.—SECORD (Monthly Cyclopædia of Practical Medicine, Jan., 1905). The author states that there are no absolute contra-indications to the operative treatment of spina bifida. The worse the case the more marked becomes the futility of other than operative measures, and the greater the probability that the child will die if let alone. Paralysis, hydrocephalus, and marasmus, often spoken of as contra-indications, should not be so considered. Each has been, and may be improved. As to method, in meningocele, opening of the sac, after dissecting up the skin by a pair of lateral incisions, suture of the neck, and removal of redundant tissue. In myelomeningocele and syringomyelocele, the same method combined with loosening of the nerve cords, and return of the same to the canal. As to the prognosis, meningoceles, with more extended experience, should yield practically uniformly favorable results. In cases of syringomyelocele and myelomeningocele, owing to oft-present nerve involvment, the results will not be so encouraging. Paralysis may be relieved. As to technique, absolute asepsis, combined with as little handling of nerve tissue as is essential, will give the best results. Loss of cerebrospinal fluid in moderate amounts is not of importance. Operating on an inclined plane is not necessary, and the use of bony flaps is rarely, if ever, essential.

PEDIATRICS

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ORIGINAL ARTICLES

LEPTOMENINGITIS[1]

By J. W. Vanderslice, M.D.,
of Chicago.

Acute inflammation of the pia arachnoid occurs from a variety of causes. Clinically, we most frequently see that form due to extension of inflammation from adjacent areas, as in diseases of the bones of the cranium—the temporal bone being the one most frequently at fault. This is easily explained by the anatomy of the part. An otitis media may light up a meningitis by causing a sinus thrombosis, in which occur purulent changes, or may extend from the lining of the mastoid cells.

Other sources are the nasal cavities, the frontal sinus, and cribriform plate, and the frequent occurrence of cerebral congestion from trivial causes owing to the undeveloped vasomotor apparatus. The greater tendency to catarrhal inflammations of the upper air passages, affords good culture media for the development of a meningitis. The frequent falls and bumps, and blows on the head may give rise to a hyperemia that may develop into meningitis; sun-stroke may also be an exciting cause. As a secondary affection, meningitis occurs following operations, severe trauma, etc. It develops also in a number of acute infectious diseases, as pneumonia, enteritis, erysipelas, septicemia, small-pox, typhoid, scarlet-fever, measles, grippe, ulcerative endocarditis and rheumatism, and is frequently a terminal infection in nephritis and the wasting diseases of early life.

We have the simple, or idiopathic meningitis, and the epidemic cerebrospinal fever. Bacteriologically, we recognize principally four groups—the diplococcus intracellularis, or a meningeal coccus; second, the pneumococcus; third, tubercle bacillus, and fourth, the streptococcus; the gonococcus, typhoid bacillus, colon bacillus, and staphylococcus, have each been isolated as the causative factor.

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[1] Read before the Chicago Pediatric Society, May 23, 1905.

In the greater number of cases of epidemic cerebrospinal fever, idiopathic meningitis, chronic basilar or posterior basal meningitis, the diplococcus intracellularis is the bacillus met with,—nevertheless, we may have, clinically, any of these forms of the disease, and not be able to find the diplococcus intracellularis. In cases due to trauma, and following septic process, the streptococcus is most frequently found.

Pathology.—The varied conditions under which meningitis appears, modify, to a considerable extent, the morbid changes found after death. In cases of extension of contiguous inflammation to the pia arachnoid from necrotic bone, or superative process, there is usually found a characteristic condition—the sub-arachnoid fluid is turbid; pus may appear only in whitish streaks in the milder cases, and in the more virulent, may accumulate in the sulci, and in the subarachnoid spaces at the base of the brain. Pus may even be in such an amount as to hide the vessels from view. The meshes of the pia arachnoid are filled with a fibro purulent deposit. The intracranial portions of the nerves may also be involved in the inflammatory condition.

In meningitis secondary to the acute infectious disease, the macroscopic changes may be much less marked. The subarachnoid fluid may be but slightly turbid, the pia mater being but slightly anemic. In many cases, the ventricles are also involved. Here, we usually find the walls roughened, and the ventricles containing a turbid fluid, sometimes purulent. The amount of this fluid is very variable. When there is any considerable amount of effusion, the brain substance shows evidence of it in hemorrhagic points, softening and pus; the hemispheres look pale and anemic.

In serous meningitis, so-called, there is but slight involvment of the pia, it showing only a cloudiness, the effusion of a serus fluid into the ventricles being the distinctive feature. This effusion is free from pus. Many cases occur which are clinically diagnosed as meningitis, terminating in death, in which no change can be found post-mortem of a meningitis.

The inflammatory condition may involve either the basal, or cortical meninges; when the cortical portion, the inflammation is usually bilateral; that following middle-ear disease may be unilateral. In the chronic basilar, and that following the wasting diseases of childhood, the base is usually involved.

Symptoms.—No disease with a known anatomical lesion, has such a wide range of symptoms, nor is there any other whose symptom complex varies so greatly in given cases, as in this disorder. Cases come to the post-mortem with well-defined lesions, without being suspected during life, while others with all clinical symptoms, upon post-mortem show no meningeal inflammation. That a meningitis developing secondarily, upon an acute disease, may be quite masked by the primary disorder is not infrequently demonstrated.

Onset.—There are three well-defined modes of onset—first insidious; second epileptiform, and third, hysterical. In the insidious form, we may have a prodromal stage of one to four days. This, however, is frequently lacking. The early symptoms are ill-defined, being the symptoms of malaise, with temperature ranging rather low; night terrors are common, and constipation the rule. The epileptiform cases are usually ushered in with a general convulsion, or vomiting, with fever and headache.

In the hysterical onset there is usually giddiness, delirium, or somnolence; marked hyperesthesia, especially to light and sound; the course of the disease is from 8 to 10 days, to as many weeks. There is no typical picture. The chief characteristic is the irregularity of the symptoms. The most characteristic and frequent symptom is the contraction of the muscles of the back of the neck, causing a cervical opisthotonos. This tenseness is usually an early symptom, and can usually be brought out by asking the child to put his chin on his chest. The older children will sometimes open their mouths in their desire to carry out this request. Constipation, early and persistent, in spite of medication, is the rule. The abdomen is retracted, and emaciation begins early and in protracted cases is extreme. Headache is usually complained of early, gradually becoming more and more severe, and is usually frontal. Evidence of this is given by the patient even in sleep, by a frowning expression and the constant carrying of the hands to the head; in young children, by the sharp cephalic cry and rotation of the head from side to side. Sighing respiration is frequently an early symptom, and of considerable value in the diagnosis. This sighing respiration gradually gives way to the Cheyne-Stokes type. Tache cerebrale is also one of the more constant and early symptoms. The pupils early, are usually contracted; later they may be unequal, and in late stages they are dilated, and frequently immovable. There may be a divergent strabismus and in the fundus congestion of the disc. The use of the ophthalmoscope is not practically of much benefit, as in younger children it is next to impossible to make observations of any value.

Sensitiveness to light and sound is usually manifested. The patient desires to be quiet, and is peevish and irritable when questioned or examined. Quite frequently, there are marked mental changes.

Vomiting is of common occurrence, and one much emphasized as an aid to diagnosis, but one should not lay too much stress on so-called cerebral vomiting, as too often the vomiting is that of an ordinary indigestion, recurring but a few times. When cerebral vomiting is present, that is, vomiting which occurs with little or no nausea, regardless of ingesta, and is propulsive, it aids in clearing up the diagnosis. The pulse is usually wiry and irregular, and slow as regards ratio with the temperature, and the tongue is usually coated, a sordes of teeth and lips sometimes aggravating accompaniment.

Kernig sign—the inability to extend the leg at a right angle to the trunk can generally be made out, but too much importance must not be attached to this sign, as it is so often found in other conditions. The patellar reflexes may or may not be increased early. They become decreased or absent later in the disease. Babinski is not constant.

The motor system shows a great variety of symptoms. There may be general convulsions; spasmodic contraction of the face, especially of the masseters, causing a grinding of the teeth, emitting a grating unpleasant sound. The posture of the patient, where the base is involved, is characteristic. The head is retracted, limbs flexed, and the patient always lying on the side. Sometimes the retraction of the head is of one side only. The fontanelles are tense and prominent. The fever ranges from 100 to 104 with no typical curve. The temperature is not a guide to the severity of the disease, and in fatal cases may be subnormal throughout. Retention of the urine is of rather a common occurrence, and must be carefully watched for. Vertigo, restlessness, somnolence, stupor, pain and hyperesthesia over spine, may each be more or less prominent, in any given case.

Location and extent of the inflammatory process, to a considerable extent, governs the symptomatology. In basilar meningitis, there is extreme opisthotonos, and the early disturbance of the sight, hearing, taste and smell, is not uncommon.

The late symptoms are coma, paralysis and incontinence of the feces and urine: Cheyne Stokes respiration usually disappears sometime before death. Any and all of these symptoms may be present, or absent, in any given case, or may be marked, or trivially slight.

The most frequent complication is pneumonia. The sequelæ include hydrocephalus, blindness, deafness, and mental disorders.

Diagnosis.—At times the diagnosis of meningitis is exceedingly difficult, as so many of the general symptoms are present in other conditions. However, the mistake is probably more frequent of calling another condition meningitis. than in miscalling a meningitis.

Although it is often impossible to diagnose this disease early, the diagnosis having once been made, it has always seemed that a proper consideration of the symptoms should have led to an earlier diagnosis. In questionable cases under observation, one should always have meningitis in mind—not waiting for some train of symptoms to call attention to the disease. In meningitis, there are no one or two symptoms upon which alone a diagnosis may be made, but a study of the clinical picture, made up of the various symptoms, with a close careful examination into their several causes, must be made before making a diagnosis.

It is not well to lay too exclusive a stress on any one symptom, such as headache, Kernig, cervical rigidity or convulsions, as these symptoms may occur in the course of many of the general diseases. Convulsions and stupor are often found to accompany almost every pyrexia in certain nervously constituted children, which pass off without after-effects. It is to be remembered that in meningitis we have no typical clinical course —that the symptoms vary very greatly in different cases, and that there are no one or two symptoms, the absence of which excludes the diagnosis of meningitis.

A few of the important aids in diagnosis will be the irregular temperature, with no corresponding rise of pulse rate; headache, persisting during sleep, as evidenced by the actions of the patient; the unilateral convulsions, rigidity of the muscles of the back of the neck, spasm or tremor of one limb, or side of the face; constipation, tache cerebrale, the retracted or breadpan abdomen, bulging or tense fontanelle.

In lumbar puncture, we have a very simple procedure, that is of great value in clearing up a diagnosis of meningitis. This is very easily performed, and if a proper aseptic technique is carried out, the operation is practically harmless. It can be done with a hypodermic needle, and is usually made between the third and fourth lumbar vertebræ, a little to one side of the median line. The patient's body should be well flexed, so as to separate the vertebræ as far as possible and the fluid is usually reached at a depth of about one inch. There is usually no need of an anesthetic.

A macroscopical examination of a small amount of fluid will usually make the diagnosis, as a simple turbidity of the fluid is quite enough on which to base the diagnosis.

In making a differential diagnosis between the various forms of meningitis, it would of course be necessary to have a microscopic examination, but this, however, has not given the satisfaction that might be supposed, as the findings, in many of the cases, have been negative, while in others it has been found a mixed infection. When, however, one finds the tubercular bacilli, or the finding of diplococcus intracellularis, the diagnosis is complete.

In making a differential diagnosis, it is better to make the diagnosis by exclusion, rather than by paying too much attention to the meningeal symptoms. The diagnosis from typhoid is made by the course of the fever, abdominal tenderness, rose spots and Widal affection. In pneumonia, a careful examination of the lungs should clear up the diagnosis. In acute purulent otitis media, it is frequently impossible to be sure of the diagnosis, especially so, in cases of double otitis media, as in these cases there may be headache, giddiness, delirium and even strabismus, and yet have all these clear up after a free discharge of pus. The point of most value in such cases, is deafness without facial paralysis, as in meningitis the auditory nerve is never injured without involving the facial. Hysteria may be mistaken for meningitis, or vice versa. We must always bear in mind that the existence of a grave disease does not preclude the existence of another. This is especially true of hysteria, during the earlier period of an acute disease. Here, the local symptoms are of great value, such as the existence of a divergent strabismus, ptosis, inequality of the pupils, the pulse rapid in hysteria, slow in meningitis. In the wasting diseases of early life we have the depressed fontanelle, coma, convergent strabismus, the symptoms of brain anemia as against congestion.

In meningitis, we distinguish the various forms which are characterized by their various symptoms, the distinctive course they run, and their termination. The inflammation may affect the pia arachnoid at both the convexity and the base, or may be confined to one or the other, more or less exclusively—variation in location causing decided differences in the symptomatology.

In meningitis of the convexity, we are apt to have an early and pronounced delirium, and by the proximity of the motor centers, monoplegia, spasms, stiffness or tremor of the limbs are more commonly seen; also aphasia and vomiting; a paralysis affecting only the lower part of the face is presumptive evidence of meningitis of the opposite convexity. In meningitis of the base, the facial paralysis is complete, the trunk of the seventh being involved; also the ocular symptoms are prominent, and stiffness and cervical opisthotonus are marked.

Serous meningitis is distinguished from purulent, by its more gradual onset, slower and more lingering course. The general symptoms are those of compression and hebetude, rather than of cerebral irritation; choked disc is common; the effusion is noticed by an early enlargement of the head. The diagnosis between purulent and epidemic cerebrospinal meningitis cannot be made clinically, herpetic and petechial eruptions indicating the epidemic cerebrospinal meningitis.

The diagnosis between tubercular and purulent cannot always be made with certainty. In tubercular meningitis, the finding of other tubercular process and the very gradual onset, are of assistance in diagnosis. Vomiting and ocular symptoms are apt to be more pronounced. The disease runs a slower course.

Skeers' sign—a light cloudiness at the pupillary margin of the iris, is of great value if found; in cases of non-tubercular posterior basal meningitis the most prominent and often the earliest symptom is opisthotonos, the lower limbs being markedly spastic, loss of vision with no optic neuritis, and an early hydrocephalus being a common picture.

In syphilitic meningitis, the diagnosis can only be made by the history of the patient, and the reaction to medication.

The prognosis.—The prognosis of meningitis is always very grave, although somewhat modified by the conditions producing the inflammation. The course of the invasion, the rapidity of advance, and the prominence of graver symptoms, are guides to the prognosis. That cases of all forms of meningitis have recovered, is a fact recorded by most competent observers. The cases of acute serous meningitis and non-tubercular basal meningitis may subside at any time and become chronic, but in these cases, an acute exacerbation may take place at any time. Even when a patient lives through a case of meningitis, there usually remain serious defects, the most common of these being hydrocephalus, blindness, deafness and mental disorders. A fatal termination may take place at any period. In cases lasting any considerable time there is frequently a transient amelioration of all symptoms. One must guard against too great hope in such conditions.

Treatment.—The treatment of meningitis is far from satisfactory, but by our knowledge of etiology we agree that in most of the cases coming under observation the infection takes place through the nose, either by extension from the ear to the meninges or by the entrance of the micro-organism from the spinal fever the organism has been quite constantly found in the nasal secretions. Therein lies our key to the prophylaxis, so we must emphasize the importance of the nasal douche. It nasal mucous membrane. In all the late epidemics of cerebro-should be insisted upon, that a part of the daily toilet should be the cleansing of the upper air passages.

The active treatment of the inflammation consists chiefly in the use of the ice bag or coil, to the head and back of the neck, counter irritation by the use of iodine, blisters, and paquelin cautery. The application to the shaved head of inunctions of iodoform, mercury, belladonna, ung. crede., have all enthusiastic supporters, but it is doubtful if any procedure which increases the discomfort of the patient is of practical value. The value of intraspinal injection of antiseptics is not proven at this time. Blood-letting is quite commonly advised, but is of doubtful value, as even a few drops of blood may be the straw which will change the balance in favor of the child's life.

The general treatment consists in putting the patient at absolute rest in a cool, darkened room, removing all sources of external irritation possible, as noise, bright lights, handling of the patient. The fever should be controlled by bathing. The digestive tract requires our especial attention, and the food must be readily digestible, or it may be best to give a digested, or a partially digested food, by gavage. The elimination must be kept up; the constipation must be overcome. The use of calomel, castor oil and salines alternately is indicated as is stimulation of the kidneys by diuretics, and one must be always on guard for the retention of the urine.

There is no drug of any special value, insofar as affecting the morbid process. Mercury and iodides are most frequently recommended, to be pushed even to a point of salivation; that they are of any value in cases other than syphilitic, is questionable, and they probably do harm by deranging the digestion. Headache, the most distressing symptom, and the most difficult to relieve, is best treated by ice locally, and bromides, these not given alone for the headache, but for their effect on cerebral circulation. The use of opium or coal tar preparations is of doubtful value.

Vomiting is best treated by small quantities of cracked ice. In a purulent meningitis, due to extension, as from middle ear disease, attention must be paid to the clearing up of the initial process. The indication is to relieve cerebral pressure, especially in basal meningitis, by draining of the ventricles into the subdural space or through the anterior fontanelle externally or by lumbar puncture. The drainage is to be kept up constantly and should be done early; even though the procedure has not been of any marked success as yet, the early use of drainage has been at least partially successful. Its immediate benefits are frequently obvious in the diminished severity of the symptoms; the general indication is to keep up the patient's strength. Stimulants are usually indicated at some period of the disease, by the flagging heart. Here alcohol, digitalis and caffein may be used. Strychnine is contra-indicated.

SOME RECENT WORK IN DISEASES OF CHILDREN.*

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INFANT FEEDING.

The influence of defective hygiene in early life upon physical deterioration of the race has attracted considerable attention recently; and it is admitted that probably in no respect is hygiene more faulty than in the matter of infant feeding. The evil results of improper feeding during the first two or three years of life are not to be reckoned only by statistics of infantile mortality. It is even conceivable that such figures—appalling as they are—represent far less damage to the nation than is inflicted by the multitude of undergrown weakly persons, who as the result of prolonged malnutrition during the period when development should be most active, namely, during the first two years of life, are henceforth below the normal standard of physical development. As one means of coping with this evil the introduction of municipal milk-depots has been tried; the immediate object being to supply the poor with pure milk, suitably diluted and sterilized. This plan has been on trial longer in America than in England, and already reports of its success are accumulating. At Rochester, New York,[1] the mortality in infants under one year has fallen 65 per cent. since the introduction of a municipal milk-supply seven years ago, the mortality of children between one and five years has fallen 58 per cent.

In France similar work is undertaken by two different classes of institutions, the one the "consultation de nourissons," —at which the feeding of infants from the time of birth until about the ninth month is supervised by the Maternity hospitals, whose officials see that breast-feeding is used as far as possible—the other the goutte de lait, which deals chiefly with hand-fed children in connection with dispensaries, and distributes milk for infant-feeding under expert medical guidance.

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*Practitioner.

Of the infants fed from the gouttes de lait 20-25 per cent. die according to M. Variot,[2] who points out that the majority are already marasmic or diseased when they first come under supervision. The municipal supply of milk for infant-feeding, as at present conducted in this country, has recently been criticised by Dr. Carpenter[3] who points out that even healthy infants have digestive peculiarities, and that to supply stock milk-mixtures, according to the age or size of the infant, is not the correct solution of the dietetic problem. Each infant must be considered individually, and although many healthy infants may thrive on stock mixtures, selected with no particular skill, there are many more whose feeding requires special, and sometimes repeated, adjustment before it will suit. "Municipalities," he says, "are no more qualified to preside over infantile dietetics and infantile bowel complaints, which cannot be dissociated, than are the proprietary food vendors." All such milk-supplies should be under immediate medical supervision. In this country also the milk is sterilized, and already a case in which infantile scurvy is attributed to this sterilized municipal milk has been recorded by Dr. H. Ashby.[4] Whether scurvy is likely to be a frequent result or not, there is little doubt that sterilization of milk is bad. It somehow interferes with its nutritive properties, and perhaps renders it less digestible. On these grounds Professor Ausset[5] has been using Pasteurized milk in the goutte de lait of one of the provincial towns in France, and finds that with milk so prepared he can feed infants from the first on whole milk, whereas if the milk was sterilized it was necessary to dilute it until the infant was four months old.

Some important observations were recently made by Drs. Robertson and Mair[6] on so-called "sterilized milk" supplied from an Infants' Milk Depot by the Leith Corporation. They found that only 15 per cent. of the bottle examined failed to yield some growth of bacteria. The term "sterilized" may therefore be wrong and misleading, and if it leads to neglect of keeping the municipal milk in as cool a place as possible, the mere term "sterilized" may do harm.

If the municipal supply of milk for infant-feeding is open to objection on the grounds mentioned above, it is to be hoped at least that it may ensure the purveyance of cleaner milk than these infants would otherwise obtain. That the use of clean milk is a weighty factor in success in infant-feeding seems to be shown by the recent observations of Park and Holt[7] in New York, who found that, amongst the poor class living in tenements, infants who were taking cheap "store-milk," and were suffering with prolonged diarrhea, were in several instances promptly cured by simply substituting clean milk for the previous food after an interval of no milk; and from a small series of observations on infants fed on the best milk, which was supplied in sealed bottles, and modified in the ordinary way at home, they concluded that with the cleanest milk from the best-cared-for cattle, the smallest number of bad results occurred. This conclusion was in agreement with their general finding that the most important factor in securing good results was not so much the particular variety of milk used as the exercise of intelligent care by the parents. Under this head "intelligent care," they include cleanliness of bottles and teats, clean storage of the milk, and careful preparation of it for each feed, and, moreover, proper clothing, care, and cleanliness of the infant itself. Where the mother would carry out these duties with care, the character of the milk was found to matter much less than had been expected. But perhaps the most interesting of their conclusions was the relation of season to the effects of different methods of feeding. It was found that in the winter the results were almost equally good whether the infant was fed on cheap milk, condensed milk, good bottled milk, milk from central distributing stations, or the breast, but that in summer there were marked differences according to the kind of milk used, the best results being obtained with good milk sold in sealed bottles and modified at home, and with the milk distributed from the distributing stations, where it was supplied in separate bottles for each feed already modified. The authors, therefore, recommend that during the hot months of the year milk should be supplied for infant-feeding from some such institution, supported by municipal authorities, if private philanthropy is not available; and they point out that the advantages of such provision are chiefly the constant oversight of the child, and the very small scope left to the mother for faulty methods of food preparation.

The supply of a clean and bacteriologically safe milk is undoubtedly a great desideratum; but, as Dr. T. M. Rotch,[8] points out, unsuitable modification of pure milk may be almost as disastrous as the use of impure milk. The importance of exact methods, in modifying the percentage of the various constituents, is that only by such methods can we determine intelligently what variations can be employed in the individual case. Precise and unvarying percentages are certainly not necessary in the feeding of the majority of infants, but it is equally certain that there are cases in which even slight variations in the percentages of the various constituents produce effects either good or bad. Perhaps there is no more striking illustration of the insufficiency of theoretical "rule of thumb" than the excellent result, which has been obtained by some observers, from feeding infants, even a few weeks old, with undiluted cow's milk. Fitschen[9] has used milk undiluted as early as the tenth day of life, and states that it is most suitable for infants over the age of four weeks. For infants who have been breast fed, the amount of undiluted milk should be half the quantity obtained from the breast—which can be ascertained by weighing the infant immediately before and after suckling—and although at first some dilution may be necessary, the dilution is rapidly diminished and soon discontinued altogether. Another method of determining the amount of undiluted milk to be used is given by Dr. Haworth,[10] who considers that 1-100th of the total body weight of the infant represents the amount of milk to be given at each feed. Even more subversive of all the canons of infant-feeding is the use of undiluted topmilk,[11] made by allowing milk to stand in a basin for two hours. This was found to contain 8 per cent. of fat, and yet, in feeds of four ounces every three hours, it caused a wasted infant of nine months to put on weight, and when subsequently tried in 31 cases was found to be very successful.

But although some infants will flourish on almost any modification of cow's milk, correct or incorrect in theory, it still remains true that for the majority more careful modification of milk is necessary, and probably no one constituent gives more trouble than the curd-forming proteid, caseinogen. To avoid this difficulty of digesting curd, dilution is often carried to a degree which renders the mixture too weak to have its proper food-value, or resort is had to peptonization, which is objectionable on several accounts. Recently a simple method has been described by Dr. F. J. Poynton,[12] whereby both these measures may be avoided. It has been shown that the addition of sodium citrate to cow-milk renders the curd formed with rennet less dense, and it is found by experience that sodium citrate given regularly with the food has no injurious effect upon infants; this salt is therefore added to the milk-feeds in the proportion of one grain to the ounce—or if necessary 1.5 or 2 grains may be used—and it is found that the digestion of curd is greatly facilitated. Sodium citrate is easily soluble in water, so that the amount necessary for each feed can be prescribed in a drachm of water; for instance, if a mixture of two ounces of milk with one ounce of water is being used, and a grain of sodium citrate to the ounce of milk is to be tried, a solution is ordered, containing Sod. Citrat. gr. ij. aq. ʒi, of which the nurse is directed to add one drachm to each feed ordered: thus a sufficient quantity can easily be supplied to last several days. The only drawback was a tendency to produce constipation. The method has, of course, its limitations: in particular, it may fail in some of the more pronounced cases of milk-dyspepsia. It is in the mild cases that it has so far been found most useful.

"IDIOPATHIC" DROPSY IN CHILDREN.

Under this heading has been given by A. W. Fairbanks[13] a summary of published cases of edema, generalized or local, occurring in infancy and childhood without apparent cause. It is clear, however, that in a majority of the cases the edema was associated with more or less severe illness, and amongst the infants a common association was diarrhea. In a considerable proportion it supervened on a condition of pronounced marasmus, and in about a quarter of the number there was definite anemia. These cases of symptomatic edema, without any evidence of renal affection, are common enough in young children; far more puzzling are those cases, of which he mentions several, in which children a few days old develop general dropsy, sometimes with ascites, sometimes without, with little or no pyrexia and with nothing abnormal in the urine except that it is of unusually low specific gravity (1004-1010). In most of these cases the dropsy gradually disappears after a week or two. Some of these attacks have followed after a severe bout of diarrhea, but in others no such association was noticed, and it seems likely that they are similar in character to the dropsy which has followed scarlet fever, varicella or measles in several cases—a condition which at first sight strongly suggests nephritis in the urine. Such cases can at present only be grouped together as presenting points of similarity in their clinical course. We know nothing of their pathology, and there is little evidence to support the explanation offered by Fairbanks for these, and for the various other cases of "idiopathic" edema, namely, that the edema is "produced by a reflex sympathetic disturbance having its origin in a direct exciting cause acting on any portion of the sympathetic system, but producing its effect through the terminal filaments in the vessel walls." But, as De Wolf[14] points out in discussing the edema which occurs in infants with diarrhea, it would be rash to assume that the kidneys were necessarily unaffected because the urine was free from albumen. There is evidence that pathological changes may exist in the kidney, and cause edema, without a trace of albuminuria; and he would attribute the edema of diarrheal diseases in infancy to some infection spreading from the gastro-intestinal tract, and producing changes in the blood and the walls of the blood-vessels, and also in the kidneys.

Of considerable practical interest in this connection are the observations of Potter,[15] who found in several cases of diarrhea with marasmus and edema in infancy, that an increase of the proteids in the diet was followed by rapid disappearance of the edema. Most of the cases had been fed with very dilute mixtures on account of the diarrhea, and when the proteid was increased from 1 or 1.5 per cent. or less up to 2 or 2.5 per cent., the edema disappeared, sometimes in twenty-four hours. In none of these cases was there any evidence of renal affection.

GONORRHEA AND VULVO-VAGINITIS IN CHILDREN.

This has been the subject of much investigation recently; according to Dr. Kimball[16] there exists in infants a remarkable predisposition to infection with the gonococcus, and this is the greater the younger the child. In the newly-born the mother is the usual source of infection, but in older children there is often no obvious source. Amongst 600 admissions to the Babies' Hospital in New York in one year, there were 70 cases of vulvo-vaginitis and 10 cases of arthritis due to the gonococcus, and a large proportion of the vaginitis cases were infected while in the hospital. In spite of careful preventive measures the infection reappeared again and again in the hospital; and it was found that only by complete isolation of infected cases could the spread of the disease be prevented. If such isolation is impossible, it is essential that the napkins from an infected infant should all be sterilized; this measure, however, often failed, and it was found to be safer to use sterilized "opera cloth" which could be destroyed directly after use. Dr. Kimball reports eight cases in which pyemia resulted from gonorrheal infection in infants under the age of three months; seven were males, one was a female. In six of these cases there was a purulent polyarthritis; in two cases only one joint, the knee, was involved; in none was there any urethritis or vaginitis; only one showed ophthalmia, and this developed after the joint-affection. A microörganism, thought to be the gonococcus, was isolated from the pus in the joints in each instance. Six of the infants died—four during the acute stage, two from marasmus after the joint-affection had subsided. Three cases were examined post mortem, and all of them showed in addition to the arthritis some broncho-pneumonia. The route of infection in such cases is by no means obvious; it suggested that a gonorrheal stomatitis—a condition of which numerous instances in infants have been reported—may be the starting point, and one of Dr. Kimball's cases seemed to support this view. The probability of respiratory infection was also suggested by one case in which infiltration of the trachea was found, and gonococci were grown in cultures from the mucous membrane.

Woods[17] considers that the great majority of all cases of vulvo-vaginitis in children are gonorrheal in origin, but points out that the mere finding of diplococci in the vaginal discharge is no proof of gonorrheal disease, as several other varieties of diplococci beside the gonococcus are found in the vaginal secretion. He refers to cases in which infection was traced to towels, to a rectal thermometer, and to using a public bath; this last source was considered to have infected 160 persons, many of them children.

That such infection may lead to far more serious results than a mere vaginal discharge and local irritation has been shown by the many cases now on record where not only arthritis but also acute peritonitis has supervened. Dr. Northrup[19] describes two cases in sisters, aged nine and eleven years respectively. Both developed acute peritonitis, which at first was thought to have originated about the appendix, and accordingly laparotomy was done in the earlier case. Nothing was found beyond extreme injection of the peritoneum and a few drachms of fluid in the pelvic fossa. This patient, and the other, whose abdomen was not opened, both recovered. The vaginal discharge in each case was shown to contain the gonococcus. He refers also to eight cases reported by Comby, all in girls from six to eleven years old, and all showing symptoms of acute peritonitis; in none of these was laparotomy performed, although in some of them it was carefully considered; all made a good recovery. One feature of this complication specially noticed by Comby is the rapid subsidence of the symptoms of peritonitis in some cases which have begun most acutely. But the prognosis is not always so good. According to Galvagno the mortality from gonorrheal peritonitis in children is about 20 per cent. The same writer points out that in some cases the peritonitis is localized, and finds ten such cases in children recorded. It would seem that the peritoneal inflammation may be chiefly about the uterine appendages, the infection having travelled through the tubes and set up salpingitis, which may give rise to a localized resistance appreciable by rectal examination. One such case in a child aged six years has been recorded by Mr. L. Bidwell,[19] in which laparotomy was done and the tubes removed, as they were full of pus. In another case, aged 3½ years, recorded by Dr. Carpenter[20] the pelvic inflammation detected by bimanual examination subsided spontaneously.

The occurrence of gonorrheal peritonitis was observed in two sisters, aged respectively 12 and 6½ years, by Sebilleau. Both recovered without operation, and the author emphasizes the favorable course which most of these cases run as a reason for not having recourse too readily to laparotomy. It is noteworthy that in the majority of cases which have been recorded as instances of gonorrheal peritonitis no evidence of the cause of the peritoneal inflammation is adduced beyond the presence of diplococci resembling gonococci in the vaginal discharge, and considering the frequency of vaginal discharges in children, and the ascertained frequency of diplococci which resemble gonococci in these discharges, it may be doubted whether the mere association of so common a condition with an acute peritonitis is sufficient evidence that the peritoneal inflammation is due to the gonococcus in all such cases. The treatment which has been recommended for gonorrhœal vulvo-vaginitis in children is, in addition to the prophylactic measures already mentioned, douching with a solution of potassium permanganate (1 in 1,200), or with protargol (2-5 per cent.). Kimball (*loc. cit.*) states that after trying various antiseptic douches he came to the conclusion that protargol gave the best results. After the douching powdered boric acid should be freely dusted over the vulva.

EPIDEMIC INFANTILE PARALYSIS.

Several epidemics of infantile paralysis have been recorded within the past ten years, and their occurrence is generally considered to support the view that "infantile paralysis" is an infective disease due to some specific *materies morbi.* One of the most recent is that recorded by Wade,[21]and also by Litchfield,[22] as having prevailed in Sydney during the months November, 1903, to March, 1904—the summer months. The former observer mentions 34 cases, all of which occurred in December and January, the hottest period; 16 were males, 18 were females; the youngest was 13 months, the oldest 7 years of age; 15 of the cases were between the ages of 18 months and 2½ years. The disease began suddenly with fever and vomiting, the most marked symptom was the pain in the affected limbs, tenderness in the muscles was also very marked and persistent, in most cases for three or four weeks, there were only two in which tenderness could not be found; the onset of paralysis varied from the first day up to the fourteenth day. The limbs were affected as follows: All four limbs, four cases; one arm, both legs, four cases; one leg, both arms, one case; right leg and arm, three cases; left leg and arm, two cases; left leg and right arm, one case; both legs, five cases; one leg, thirteen cases; one arm, one case. The face was affected in one case; the abdominal muscles were affected in one case. Four months after the beginning of the epidemic there was some paralysis remaining in some muscles and groups of muscles in every case. One exception should perhaps be made—a child, aged 2 years, who was suddenly seized with fever, vomiting, headache and pyrexia, which lasted four days; at the same time there was great tenderness of the muscles of the right thigh and the child was unable to walk. By the sixth day the tenderness had disappeared and the child was able to walk. Dr. Wade considers this child to have been affected with a mild attack of infantile paralysis, which ended in complete recovery.

Litchfield mentions twenty-five cases which came under his own notice during the epidemic in Sydney; twenty-one of these occurred during December and January. The youngest child was four months old, the oldest six years; the majority were in the second year of life; sixteen were males, nine were females. The symptoms were generally as described by Wade, but pain and tenderness were noted only in "about eight of the cases." In one these symptoms lasted as long as four weeks. In some of Litchfield's cases the paralysis was the first symptom, no general disturbance being present. Twelve of the children were seen at a subsequent date (within four months after the epidemic began), and all these had some paralysis remaining.

During the early months of 1904 an epidemic was reported from Queanbeyan, New South Wales, by Dr. Blackall,[23] whose clinical picture of the disease, which he had seen within a few weeks, in six cases between three and eighteen years of age corresponds fairly closely with that described by Wade and Litchfield.

The uncertainty which hangs around many of the cases recorded as epidemic infantile paralysis can hardly fail to impress anyone who studies the clinical reports of these cases; and it is noteworthy that while Wade and Litchfield record the epidemic under the heading "infantile paralysis," Blackall terms the epidemic observed by himself "epidemic polyneuritis." No fatal cases occurred, so that none of these three observers were able to determine the pathological conditions.

It may be that polyneuritis and poliomyelitis, either separately or in combination, may be produced by one and the same cause, so that one or the other lesion may predominate in any particular epidemic. In an outbreak which occurred at Poughkeepsie, in America, Dr. Chapin[24] considered that some of the cases were suffering from neuritis, and this view was supported by the fact that many of the cases made a complete recovery in 1-4 months, whilst three remained paralyzed, with much wasting of the affected limbs, and presented the typical appearance of poliomyelitis; moreover, in one case which died the autopsy showed the characteristic changes of acute anterior poliomyelitis in the spinal cord. But there is another possibility which seems worthy of consideration in such an epidemic as that described by Caverly[25] in Vermont, where the mortality was over 10 per cent.—a death-rate which would be most exceptional in infantile paralysis—namely, that the disease was cerebrospinal meningitis; and indeed, in some of the cases recorded by Caverly the symptoms are strongly suggestive of this, for paralysis was completely absent from the limbs in one of the cases which showed "rigidity of the spinal muscles, strabismus, or other symptoms referable to the nervous system." In an epidemic which occurred at Gloucester, Mass., in 1900, Painter[26] observed only one fatal case among 39 affected; no autopsy was obtained, but the symptoms in the one fatal case were those of cerebrospinal meningitis. An epidemic in Dutchess county, New York, reported by Mackenzie,[27] included cases with symptoms of infantile paralysis, as well as cases suggestive rather of cerebrospinal meningitis.

So far as any bacteriological evidence has been obtained, it would seem to make the distinction between infantile paralysis and cerebrospinal meningitis still less clear. In one case of supposed infantile paralysis, in which lumbar puncture was done by Schultze,[28] diplococci were found in the cerebrospinal fluid resembling the diplococcus of cerebrospinal meningitis; no growth, however, was obtained in culture. In a fatal case in which the lesion in the spinal cord was characteristic of anterior poliomyelitis, diplococci were found in the ventral cornua of the cord by Brooks, and the same observer found diplococci in the blood of another case of supposed infantile paralysis during life; both these cases occurred in the epidemic described by Chapin (*loc. cit.*); no growth, however, was obtained, and the nature of the diplococcus remained uncertain.

In some of the epidemics, in a certain number of the cases the infantile paralysis supervened on some infectious fever; thus, in Vienna in 1898 forty cases occurred,[29] five of which followed directly after specific fevers, namely, after measles in two cases, after diphtheria in two cases, after scarlet fever in one case. Wade also notes that in the Sydney epidemic out of thirty-four cases one occurred during pneumonia, another during measles. The interpretation of this sequence or association is not yet determined. On the one hand, there are those who consider that the vascular changes in the cord which are found in anterior poliomyelitis may be produced by various causes. Gossage,[30] discussing the etiology of this condition, quotes Dr. F. E. Batten as holding the view that "some morbid condition of the blood just precedes the thrombosis, which condition may be due to a number of causes, *e. g.*, recent specific fever, chill, bacterial infection, etc. On the other hand, Painter concludes from his observations on the epidemic in Massachusetts that, judging from clinical phenomena, we have "as good evidence of the infectiousness of anterior poliomyelitis as we have in scarlet fever"; and Gossage, who reports two cases of infantile paralysis in a brother and sister aged respectively seven and five years, where the disease attacked the two children within seven days, concludes from his discussion of the recorded facts "it is probable, therefore, that the organism associated with anterior poliomyelitis is specific to that disease, and is not concerned in the causation of any other morbid condition." On this theory the relation of specific fevers to infantile paralysis is explained either by assuming that a "weakened resistance" to the invasion of the specific micro-organism of poliomyelitis is left by the antecedent disease, or else, as Zappert puts it, that the occurrence of any of the specific fevers increases the virulence of some specific micro-organism not yet isolated. It is quite clear that, however strongly the clinical evidence may point to a specific infection as the cause of infantile paralysis, it is certainly not conclusive, and the epidemic occurrence from which most clinching evidence might be expected has by no means settled the question, which remains *sub judice*.

INTESTINAL WORMS.

There has been much difference of opinion as to the rôle of intestinal parasites in the production of various symptoms in children. Like teething, worms have been held to account for a multitude of evils, some with good reason and some with none. On the other hand, there are those who hold that intestinal worms are credited with far more mischief than they really cause, and that they are comparatively harmless. Probably, as usual, the *via media* is the safe one, and there is something more than coincidence in the association which has been noted between many symptoms, nervous and otherwise, with the presence of intestinal worms.

Sigaud (*Gaz. des Hôpitaux,* June 30, 1904) records a case in which a child, aged six years, fell as if in a fit whilst eating his supper. Speech was impaired and the right arm and leg were paralyzed. Administration of calomel and santonin resulted in the passing of twenty ascarides, after which the child soon regained consciousness and the paralysis began to diminish, and had completely disappeared within five days. Burnet[32] records two cases in which chorea occurred in girls who were found to have tapeworm. In both cases after previous treatment had failed to affect the chorea, the expulsion of the tapeworm (it was Tænia solium in both cases) or of the greater portion of the worm, was speedily followed by subsidence of the chorea. In these cases, as in the others where Dr. Burnet had observed the association of round worms or thread worms with chorea, there was a history of rheumatism either in the patient or in the family. He suggests that the possible presence of tapeworm should be borne in mind in cases of chorea which prove unamenable to the usual treatment. Symptoms suggestive of meningitis, and associated in one case with some laryngeal spasm, were observed by Pierantoni[32] in two boys, both aged three years, who were found to have ascarides. In both cases there was considerable dilatation of the pupils; one boy recovered rapidly after passing six round worms, the other after passing twenty-four.

Less obscure in their causation, though sometimes serious in their effects, are the mechanical results of round worms. Quite recently a case was reported[33] in which a boy, aged three years, who had suffered with abdominal pain and several convulsions for a few weeks previously, was suddenly seized with an attack of asphyxia which proved fatal; a dead round worm was found in the trachea. In a child who had been operated upon for appendicitis the persistence of a fistula for four months was found by Villemin[34] to be due to a round worm which had probably been lying in the fistulous track for many weeks. Whether thread worms produce irritation mechanically, and in this way may cause appendicitis as foreign bodies in the appendix are supposed to do, remains uncertain. The present writer (*Brit. Med. Journ.*, April 15, 1899) pointed out that large numbers of thread worms were often to be found in the appendix in children, and also that in such cases there was sometimes pain localized over the appendix. Heller[35] has recently published similar observations emphasizing the frequency of thread worms in the appendix, and states that Metschnikoff found them in the cecum in 12 out of 17 cases of appendicitis. Heller thinks it is unlikely, however, that the thread worms bear any casual relation to the appendicitis.

Of recent years a view has been put forward that some at least of the effects of intestinal worms are due to toxines in some way produced by them and absorbed into the blood. Cattaneo[36] injected fluid in which ascarides had been grown into guinea-pigs, and in every case pathological effects were produced, particularly paralysis of the hind limbs. None of the guinea-pigs showed convulsions. Post-mortem examination of these animals when killed showed that the symptoms produced were not due to any pyemic infection, but seemed to be due entirely to some poison contained in the fluid in which ascarides had been grown. Cattaneo argues that the production of this poison is a vital phenomenon, and therefore the negative results obtained by injection of extracts from the dead bodies of ascarides in no way invalidate his observations. It might be suggested that the changes which have been found in the blood of children affected with worms point to something more than a mere mechanical irritation, but such changes are very inconstant and it is difficult to assign any great weight to them. Boycott (*Brit. Med. Journ.*, November, 1903) made some observations on children with thread worms, from which it appears that in less than half the cases there is a distinct increase of eosinophile leucocytes (a proportion above 6 per per cent.), but he admits that an eosinophilia may occur in children without apparent cause. With ascarides no blood change was detected, and with tapeworms three out of six cases showed definite eosinophilia. The three which showed no increase of eosinophilia were adults, the other three were children. Boycott suggests that the variability of the blood-count may be due to variation in the time since infection with the worms. In the case of ankylostoma he has shown that the greatest leucocytic reaction occurs soon after infection, and this gradually decreases although the worm may remain in the intestine.

But whilst there is much to suggest some toxic effect of intestinal worms, experiments by two French observers,[37] the details of which are not yet published, point in the opposite direction. They found that extracts of the bodies of intestinal worms were entirely innocuous, and although they admit that in the case of ascarides there is produced some volatile substance with irritating effects, they think that this plays little, if any, part in the production of symptoms, and that the action of intestinal worms as an exciting cause of various symptoms is mainly, if not entirely, mechanical.

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THE INFLUENCE OF INFECTED MILK IN THE DIET OF THE SICK, PARTICULARLY IN ACUTE INFECTIOUS DISEASES, WITH A REPORT OF A SERIES of CASES OF MILK INFECTIONS IN TYPHOID FEVER PATIENTS.*

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The enormous importance of infected milk in the production of digestive disturbances in infants has for years been clearly demonstrated and generally recognized, and energetic efforts are now being made everywhere to control the infant mortality by giving babies clean or Pasteurized milk only. The profession is also alive to the fact that tuberculosis, typhoid fever, diphtheria and a number of other infectious diseases (probably most of those that are of bacterial origin, and perhaps some that are parisitic) may be transmitted through milk, and that some of these diseases certainly have been frequently transmitted. It is also well known that typhoid fever, diphtheria, probably scarlet fever, and also other specific infectious diseases, have often flourished in epidemic form as the result of specific infection of milk. There are, furthermore, a number of striking instances on record of epidemics in which there were clearly-marked clinical symptoms, but which were not due to any known specific infection, and these have at times been traced with great clearness to the milk supplied to the patients. Cases of this sort have occurred in both adults and children, and the symptoms have been chiefly sore throat or gastrointestinal disturbance, together, usually, with fever and more or less constitutional symptoms. Cases more or less closely resembling those in the epidemics last mentioned, but occurring in small numbers in a household or singly, are occasionally seen by any careful observer and found to be probably due to the milk used; at times, indeed, they have been pretty clearly shown to be milk infections.

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The types that have been mentioned are the chief forms of infection that are known to be produced by milk. In addition to these, it is recognized that milk may be the cause of toxic symptoms that are sometimes exceedingly violent and that are not directly due to the bacteria present, but to poisonous substances produced by these bacteria.

All these are widely-known possibilities, and if any of these infections or poisonings occur the attending physician, if he is alert, will attempt, among other things, to determine whether the milk is at fault. There is still another group of cases, however, in which the effects of bad milk are, I am sure, very often overlooked, chiefly because they are rendered obscure by other factors that are present. I mean those cases (occurring principally in persons on milk diet and especially in those with acute infectious diseases), in which symptoms are caused by the milk used in the diet, but in which these symptoms are not severe enough to arouse readily a suspicion as to their source; and in which similar symptoms may be and often are produced by the disease for which the patient is being treated. In other words, I mean cases in which milk does not itself produce grave and evident infection, but in which it succeeds in making worse a disease that is already more or less bad; and in which the symptoms are likely to be attributed to the disease rather than the food. That this occurs with some frequency has been generally believed by those interested in milk infections, but it is almost always a difficult point to prove, and there are, so far as I am aware, no clear records in medical literature of cases in which there has been any extensive evidence of its occurrence.

That it does occur and may be of much importance is shown by the conditions that I am about to describe, which are conspicuous in that it was possible to demonstrate the facts with much comprehensiveness, and in that the series of cases observed was large. When I went on duty in the men's ward at the Episcopal Hospital on April 1, 1903, there were 28 cases of typhoid fever in the acute wards. Sixteen of these patients were in the active stage of the disease; 12 were in the late decline or were convalescent. I was much impressed by the fact that 6 of these 16 acutely ill patients had persistent diarrhea which had resisted ordinary treatment, and that scarcely a patient in the wards was requiring enemas frequently—almost all having one to three spontaneous and often loose stools daily, while the six with decided diarrhea were having from three to ten daily. Dr. D. J. Milton Miller, who had served the preceding four months in the same wards, remarked upon the recent persistence and frequency of diarrhea in the typhoid cases, and said that he believed the milk to be responsible for it, a suggestion that met the same thought in my own mind. It is my experience and, I think, that of most other observers, that typhoid patients, when well cared for and properly fed, require enemas in a decided majority of cases, and that very few have troublesome diarrhea. More or less marked looseness of the bowels is common when cases are first seen and for a few days thereafter, but this is almost always due to previous bad feeling, and quickly responds to care in the diet, especially to a reduced amount of food. Severe diarrhea is, of course, not a normal symptom of well-managed typhoid fever, but is always an unfortunate complication; and even moderately marked diarrhea is exceptional and to be considered a complication, rather than a part of the disease. It is almost an undesirable complication, for it is likely to be associated with distention and not infrequently with abdominal pain, gastric disturbance and decided evidences of toxemia, and at best it is likely to increase the prostration and the tendency to hemorrhage and perforation.

In the patients under discussion not only was intestinal disturbance from slight looseness of the bowels up to severe diarrhea almost the rule rather than the exception, but other abdominal symptoms were also marked and common. Five of the patients complained within the next few days of attacks of colicky pain, a number showed decided distention and several were nauseated. The typhoid cases also seemed more seriously ill than is common in an equal series of cases, and abdominal symptoms other than diarrhea occupied a conspicuous place in the picture in so many cases as to lead me to discuss the cause of it repeatedly with Dr. Harrar, who was then my resident. I had never seen this class of symptoms so prominent in such a large group of cases.

It is also worthy of mention, as not improbably related to this question, that four patients had dangerous hemorrhage in the early part of April, and that three others during this time had moderate hemorrhage.

After having observed these conditions for several days and finding them persistent, I asked Dr. Ghriskey to make a count of the bacteria in the milk. I examined it chemically and found 3.6 per cent. of fat, 3.45 per cent. of proteid, and no preservatives; in other words, the chemical conditions were entirely satisfactory. Four days later Dr. Ghriskey reported to me that he had plated several specimens of the milk, and that in all he had found the bacteria uncountable after twenty-four hours in a 1 to 10 dilution, the number, therefore, being at least several millions.

These examinations were repeated several times, in order that we might be sure of our facts before giving troublesome orders; all the cases with severe diarrhea being, however, for the time, put on liquids other than milk. The diarrhea in the latter cases gradually ceased and at the end of five or six days all were having but one or two stools a day. In the meanwhile, Dr. Ghriskey's bacterial counts were carried out; and each showed a very excessive number of bacteria. One showed only 200,000, all the others millions. These figures, conclusive enough at any time, were all the more so in this instance, since it was cool weather.

On the ground of these results, I gave an order that all the patients in the ward receiving milk should have only Pasteurized milk, the Pasteurizing to be done as soon as the milk was delivered at the ward. The results were very striking. From April 15, at which time Pasteurizing had been generally established, to August 1, when my service ended, there were admitted to my wards 92 other cases of typhoid fever. Of these, 8 had diarrhea on admission. In 5 of these 8 it subsided in three or four days and the patients afterward required enemas most of the time. The three others had severe abdominal symptoms when admitted, were much prostrated, and died within a few days from these causes. Only 4 patients developed diarrhea when in the house. In three of these it was mild (three to five stools daily and soon subsiding); in the fourth it was severe. The latter patient, however, died of hemorrhage and the autopsy showed his colon to be riddled with ulcers. The local lesion, therefore, probably sufficed to explain the abdominal symptoms in his case. Of the remaining 80 patients 14 had usually one or two, occasionally three, spontaneous movements daily, some of the time requiring enemas. The 66 others required enemas most of the time, occasionally having one or two practically normal spontaneous movements. If the five that had diarrhea upon admission but soon required enemas be added to the last-mentioned group, 71 of the

92 patients usually required enemas, 14 had nearly normal spontaneous movements, 3 developed mild diarrhea in the house and 1 developed serious diarrhea in the house, the latter patient having extremely extensive ulceration of the lower bowel.

Contrast these conditions with those mentioned as having been present at the beginning of April, when there were 28 typhoid patients in the ward, 16 of whom were in the fastigium of the disease. Of the latter 16, 6 had serious diarrhea, while none of the other ten required enemas and several of them had already been under treatment for troublesome diarrhea. Of the twelve that were in convalescence or in the late decline of the disease only 3 required enemas, 3 had mild diarrhea and the remaining 6 had spontaneous movements, with an occasional day of loose movements.

An even more striking contrast is afforded by the records of the cases in the men's wards during February and March. Within these two months 48 cases of typhoid fever were admitted to the men's wards. Two died within two days, and these I have excluded from the statistics. Of the 46 others only 9 required enemas, eight had one to three spontaneous movements daily and 29 had diarrhea. Of these 29, 20 had from four to ten stools daily for from one to three weeks (in one case five weeks), while in the remaining nine there were repeated transitory attacks of diarrhea, lasting one to three days, with four to six stools daily.

Put in the form of percentage, from April 15 to August 1, of 92 patients 77 per cent. required frequent enemas and only 4 3-10 per cent. developed diarrhea in the house; from February 1 to April 1, of 46 patients only 19.5 per cent. required frequent enemas, while 63 per cent. either developed troublesome diarrhea in the house or persisted in having diarrhea for a long time after admission. The only noteworthy difference in the management of these cases during the two periods consisted in the fact that from April 15 to August 1 the milk was Pasteurized, whereas during February and March it was not.

That the difference was not due to any conditions relating solely to the men's wards is also shown by contrasting records in the women's wards during the month of March with those during June, the milk served there having been Pasteurized during the latter month but not in the former. During March 18 cases of typhoid fever were admitted to that ward. Of these patients only

6 required frequent enemas, 3 had from one to three spontaneous stools daily, 1 had diarrhea on admission, which soon subsided, and 8 had persistent diarrhea with three to ten stools daily. Two of the latter patients died after having developed diarrhea, distention and increasing prostration; 1 had severe and exhausting diarrhea, persisting throughout the disease and until put on mixed soft diet during convalescence. In June 22 cases were admitted. Of these patients 15 usually had enemas, 1 had one or two spontaneous movements, 2 had diarrhea on admission, and in one of these it persisted, while in the other it rapidly subsided; in only two did diarrhea develop while in the house, and in these it caused but three or four movements a day and subsided within three and five days, respectively.

I have stated that in the first two weeks of April, in which time there were 35 cases of typhoid fever in my service, there were four instances of severe hemorrhage and three of moderate hemorrhage, while abdominal pain, distention, nausea and severe general prostration were common. In three and one-half months after Pasteurization had been started there were in 92 cases three severe hemorrhages and two mild ones; while, except in three cases in which severe abdominal symptoms were apparently the chief factors in producing death soon after their admission, abdominal symptoms seemed largely to have vanished. Previous to April 15 they had constituted the principal feature of the group of cases; after that time there was so noteworthy an absence of severe abdominal symptoms that physicians visiting the wards remarked upon it.

The darkest corner of the earlier picture is shown by the record of deaths. Among the 46 cases admitted to the men's wards during February and March there were three in which death was caused by exhaustion following severe diarrhea, distention and other abdominal symptoms that developed in the house, and as I have mentioned, two similar deaths occurred in the women's ward during March. Among the 92 cases on the men's side after April 15 there were no cases in which abdominal symptoms could be said to have been even important contributory causes of death. The latter statement excludes the three cases that died with abdominal symptoms after admission; and it also excludes two cases that died of hemorrhage and of perforation, respectively, as I think that these accidents were unavoidable. While I do not maintain that the three deaths especially mentioned as having occurred in the men's ward during the months of February and March and the two in the women's ward in March were unquestionably due to bad milk, I do think that there is a large probability that they were. Dr. Despard, who was my resident from May 1 to August 1, and who had been daily in the wards in the preceding three months, remarked at the end of the service that the character of the group of cases had been entirely changed by Pasteurizing the milk and that he believed that this measure had probably saved as many as five lives. I consider this a fair statement.

I have remarked that the one fatal hemorrhage that occurred after April 15 was probably an unavoidable accident, and hence had nothing to do with the food. I believe equally on the other hand that the unusual frequency of hemorrhages in the first two weeks of April may, in the light of the other observations that I have recorded, be fairly considered to have been partially or entirely due to the infected milk. I am quite prepared to believe that milk infection may increase the destructiveness of typhoid ulcers, and thus increase the frequency of both hemorrhage and perforation.

It would have been of much interest to determine whether any particular microörganism produced the symptoms that I have described, but this was impossible, because Dr. Ghriskey was then occupied with a series of special observations on another subject. The points that are of particular interest in this series of cases are, however, sufficiently clear and convincing as an example of the type of milk infection to which I especially directed attention in opening this paper. It is to be noted that the infection produced by the milk was apparently not in itself severe, and that the symptoms due to the milk alone would probably not have been serious in otherwise normal persons. They acquired seriousness in these cases merely because the patients in whom they occurred were already the subjects of grave disease. Furthermore, just the same symptoms may be produced by typhoid fever alone. All these points lend obscurity to the actual meaning of the symptoms and to their source in instances such as this, and make it very easy to overlook both. The description that I have given has probably conveyed the impression of a much more clearly defined set of circumstances than those that actually existed. I might readily have overlooked the relation to the milk had the trouble developed gradually before me, but as it was, I went on duty when the disturbance was at its height, and I also had the support of the opinion of Dr. Miller, who had carefully observed the cases, and after trying various dietetic measures, had concluded that the trouble was probably due to the milk. My description is necessarily *ex post facto* and based upon accumulated records; the impression produced while the events were in progress was much less clear. I insist somewhat upon this point, because it is important to realize that in the class of cases that I am discussing we do not meet with anything that is as definite as is an outbreak of diphtheria or of tyrotoxicon poisoning, for instance; the circumstances, indeed, are far less clearly defined than they are in even the cases of gastroenteritis or of sore throat, and the like, that have repeatedly been traced to milk, for the primary disease renders them obscure.

That such mild forms of milk infection occur with some frequency is, as I have said, firmly believed by those that are interested in securing a sanitary milk supply. One meets not infrequently with individual cases or with groups of cases that are in their essential features not unlike those that I have described, but the circumstances are such, as a rule, that they do not permit of a determination whether the milk is at fault or not. I have recently seen in another hospital a case that showed the following main features: A robust young man, 28 years old, ran a mild course of typhoid fever until the beginning of the third week. Up to this time he had moderate constipation, extremely little distention and no noteworthy abdominal or other symptoms. At that time he suddenly developed diarrhea with foul stools, distention, increased fever and prostration. These symptoms continued, the disease grew rapidly worse, he rapidly lost strength, his heart failed and he died four days after the sudden change in the symptoms. I had seen him throughout his illness, and previous to this transformation his case had aroused no anxiety. I had not been in a position to have his milk Pasteurized or to see that he got a reliable milk, but bacterial counts of the milk that was given to him were made at the time and they ran (in cold weather) anywhere between 60,000 and 7,000,000. I cannot state that this man died of milk infection, but considering the sudden and otherwise unexpected appearance of the abdominal symptoms and the evident ready opportunity for dangerous infection of the milk, as shown by the bacterial counts, I do not think it is straining a point to suggest that he probably did.

Cases in which it is not quite so evident that something new has been added to the old symptoms, but in which it is wholly possible that the milk is at fault, are sufficiently common to make this matter one of very great importance. That such milk infection, even if mild, is a serious matter when a grave disease is already present needs no demonstration. Its importance to the surgeon, particularly when he is dealing with cases that require abdominal operations or have recently been subjected to them, is not less than that to the physician.

It is also evident that patients are not properly treated unless this source of danger is put aside. The main question is how to avoid the danger. Some authors go so far as to recommend that milk be not used in the diet of patients with typhoid fever and other acute diseases, because it is so likely to be unclean. This is, I think, the weakest and the worst way out of the difficulty. Notwithstanding the common recent teaching concerning the use of a free diet in typhoid fever, I constantly become more firmly convinced that a diet composed almost exclusively of good milk is, and will remain, the best diet for most cases of acute infectious disease, particularly typhoid fever. I am unwilling to join in any agitation against the use of all milk because it may be bad, and certainly, merely to say resignedly that milk is an unclean food is to submit weakly to the common carelessness and the occasional knavishness of many in the milk traffic.

The next most important possibility in controlling this danger is to have at least all milk used in the diet of the sick Pasteurized at the dairies where it is produced or directly after its reception at the hospitals or homes in which it is to be used. This measure would in large degree obviate the evil effects of that portion of the milk which is bad, but there are a number of objections to Pasteurization. The first of these is somewhat theoretical, but is, I believe, based upon right reason, and also upon experimental observations, to some of which I have referred elsewhere. This objection is that milk is served raw by nature, and that in normal circumstances it is taken raw. It is known that heating milk causes many changes in it; and it is at least possible I think, indeed probable, that heating it even moderately may unfavorably alter its nutritive quality as well as its digestibility. I have seen scurvy develop in an infant soon after Pasteurization of its milk had been ordered, the milk having previously been unheated. I do not know that Pasteurizing the milk produced the scurvy, but I am quite willing to consider such a possibility, although the Pasteurizing was properly done by an intelligent mother. Similar observations, although uncommon when the milk is not heated to a high temperature, have been made by others. This objection applies chiefly to these cases in which milk must be used for a long time, but if it is a real objection, it is also applicable to other cases and to adults as well as to infants and young children.

A second and more practical objection to Pasteurization is that many older children or adults dislike or soon grow to dislike milk that shows by its taste that it has been heated. It is true that milk may be rendered harmless, or nearly so, from the standpoint of infection by being subjected to a temperature lower than that necessary to alter its taste, but in carrying this out one goes very near the danger line, and it can be done safely only by an intelligent and conscientious person or with the aid of special apparatus.

Another objection is that Pasteurization is always bothersome, and it is difficult to get persons to carry it out carefully. Still another is that in any circumstances it needs care as to cleanliness, temperature, etc., and unless this care is devoted to it Pasteurization may make a good milk bad, and may even make a bad milk worse.

A final and very important point, perhaps the most importnnt of all, is that while Pasteurization protects against infection, it does not destroy the poisonous products of bacteria that may develop before the Pasteurizing is carried out, and these toxic substances may produce more or less grave symptoms. In this connection it is of much interest to note that while, as I have stated, persistent diarrhea and other severe abdominal symptoms almost entirely disappeared from my wards after Pasteurizing had been instituted, I have records of ten cases during this period in which transitory, but sharp, attacks of diarrhea, lasting from a few hours to a day, developed in patients who both before and afterward had moderate constipation and who received Pasteurized milk. No other cause for this having been evident, it seems to me highly probable that it was the result either of poor Pasteurizing on these days or of the presence of toxic bacterial products.

The Pasteurizing had, I think, been satisfactory, and I believe that the other explanation is the correct one.

In the present state of the general milk supply Pasteurizing is the best way out of the difficulty in case a thoroughly reliable milk cannot be secured, but the objections to Pasteurization that I have mentioned are real and important. It is almost unnecessary to say that the most certain way to protect patients is to see that, as far as possible, they receive milk that is produced, transported and delivered under hygienic conditions. It is worth while to make this rather hackneyed statement only because it is even yet so little the general custom to appreciate this point and to insist upon it firmly. When dealing with young children it is now considered the essence of carelessness to neglect it; with adults, on the contrary, both physicians and surgeons frequently still consider that the source of the milk is purely a domestic problem.

When one is treating the poor outside hospitals, circumstances justify this action or lack of action to a certain extent, for it is difficult for the poor to secure good milk, and almost equally difficult for them to keep it properly. It is, however, often surprisingly easy to convince those who are not quite paupers of the necessity of securing good milk for special purposes and of keeping it iced, even at relatively great expense. With private patients of the well-to-do class the problem is simple in some of our large cities, for the patient can, and at the word of the physician usually does, secure milk whose reliability is certified to by a representative body of physicians. In much the greater proportion of our cities and large towns, however, the public spirit of the profession has not yet provided the safeguard of certified milk, and the consumer can determine which milk is likely to be good and which bad only in case he or his medical attendant has acquired special knowledge concerning individual local milk dealers. Were the satisfaction that comes from having at hand certified milk that can be relied upon once generally appreciated by medical men in large towns and cities, I think that the energy and effort necessary to bring such milk into the local markets would soon be forthcoming in many places. When one has come to the habit of using such milk one shrinks from permitting the use of unknown milk with the same feeling that one would shrink from ordering that a clean wound be dressed with a poultice. If, however, such milks are not at hand, it is certainly part of the rational duty of physicians to take pains, as a few doctors now do, to acquaint themselves with milk dealers that make an earnest and well-directed effort to furnish clean and properly-kept milk; and also to see to it, as far as possible, that such milks become known to their patients and are used by them, during sickness, at least.

This statement applies with equal force to physicians practicing in the country. There is a traditional belief that country milk is essentially superior to city milk, but—a paradox produced by the circumstances of civilization—it as, as a matter of fact, easier in most large cities, if a little effort be used, to secure a reliable milk, free from infection, than it is in most country places. A large proportion of country practitioners will find it difficult to discover nearby a satisfactorily clean and well-managed dairy.

In hospital work the conditions are easier in some respects than in private practice, and in others more difficult. They are easier because the whole group of patients in an institution is under entire control, and if proper action is taken it insures good milk for all without the attention to individual cases. The conditions are, on the other hand, more difficult because it is always somewhat more expensive to secure good milk and keep it in proper condition than it is to pay a low market price to the most convenient bidder and keep the milk in the least troublesome and least expensive way possible; and administrative officers of institutions naturally hesitate to go to what, in bulk, seems a very large expense, unless they can be convinced that it is important.

That this conviction has not yet been by any means generally reached by managers of institutions is evident from the fact that two years ago the "Committee on Milk" of the Keystone Veterinary Medical Association in an investigation of the milk supplies of over a hundred institutions in Philadelphia found that but an insignificant fraction of these institutions had any real knowledge as to the character or source of the milk that they used, the others accepting blindly what was furnished them. Dr. Leonard Pearson has kindly given me the summary of the results of this investigation so far as they relate to fifty hospitals. The questions investigated were the number of patients, the number of children usually in the institution; the number of quarts of milk used daily, and in regard to this milk, whether its source was actually known or it was merely bought from a dealer without determining what farms it came from; whether the source was inspected and the conditions existing there determined; whether it was customary to subject the milk to any form of test or examination, and whether the dealer was required to conform to any specific conditions other than the rather simple conditions required by our local laws. The results were extremely important, but extremely shocking. Of fifty hospitals two owned their source of supply. One other hospital knew the source, had it inspected, had the milk regularly examined, and required certain specific conditions of the dealer who furnished the milk. Ten other hospitals knew the source of the milk. Thirty-seven out of fifty institutions actually knew nothing about the milk that they received except the man who sold it to them, and forty-seven out of fifty did not know the condition of the farms where the milk was produced, nor did they know the condition of the milk when it was delivered or when used by the patients, and no special requirements were imposed upon the dealer delivering the milk. Expressed in another form, in fifty hospitals 5,607 sick persons were on the average being treated each day, and 4,331 of them got milk of entirely unknown character as to cleanliness and safety; of these persons 2,032 were children, of whom 1,917 got milk of wholly uncertain quality. In these institutions 3,443 quarts of milk were, on an average, consumed daily, and of this amount 2,313 quarts were of a wholly undetermined degree of cleanliness or uncleanliness, and over 500 quarts more were of very doubtful quality. Part of the farms from which the milk came were investigated by the committee, and in a number of instances it was found that the milk was produced in some of the dirtiest and most unhygienic dairies in the eastern part of Pennsylvania. In one instance I investigated the chemical conditions of the milk supply of a hospital in which most of the inmates are children. The chemical conditions that I found, together with the bacteriological conditions that Dr. Evans kindly found for me, made it appear extremely probable that the milk supplied this institution was merely a mixture made up by the dealer from his old cream and separated milk. The bacteriological conditions in this instance were wretched, there being regularly many millions of bacteria, while the chemical conditions were utterly abnormal, the chief peculiarity being extremely low proteid (about 2 per cent.) and extremely high fat

(8 to 10 per cent.) ; and yet the administrative officers of this institution held that the children were getting an excellent milk, because they "knew that the dealer was an honest man."

This rather appalling state of affairs I frequently hear attributed to the narrowness or rigid conservatism of hospital administrators. It is rather due ordinarily to the inaction of the attending staffs of the hospitals. The facts that I have given suffice to show that in typhoid fever—and if in typhoid fever in other diseases also—infected milk may greatly endanger the lives of those to whom it is given, and may actually take life without even producing any clearly recognized specific disease. I am convinced that most hospital managers will appreciate this point if it is urged upon them with faith and energy by those whom they properly consider responsible for the welfare of the patients. Managers of hospitals have with great reasonableness told me in connection with this matter that they cannot be uniformly prepared to act on technical matters unless the necessity for action and the proper course to be pursued have been indicated to them. Together with most others of the educated lay public, they have been thoroughly convinced of the necessity of expensive measures to prevent surgical sepsis and of the dangers of narrow economy in such matters; and it requires only earnestness and determination to make it clear to any intelligent person that wound infection and gastrointestinal infection are not essentially different in their nature or results and may be of equal importance. Since the above mentioned investigation by the committee of veterinarians the Hospital Association of Philadelphia, an organization composed of the chief administrative officers of many of the hospitals of the city, has, largely as a result of the cheerful labor of Dr. Lawrence Flick, interested itself in securing improvement in the milk supply of the hospitals. It is in large part due to this action following upon the investigation by the veterinarians that some of the individual institutions that did not previously do so now exercise chemical and bacteriological control of the quality of the milk instead of accepting it on faith. They also in some instances demand and determine that the dairies from which their milk comes shall be conducted with proper cleanliness and care, and that the milk shall be delivered immediately, under good conditions as to temperature and cleanliness. Far more than this is necessary before the conditions in most of the hospitals can be considered to be anywhere near satisfactory, but the evil has at last been demonstrated and it is now readily possible to take effectual action if those in control desire to accept the opportunity.

At the Episcopal Hospital energetic action preceded any general movement. Previous to the observation of the conditions that I have described the milk was merely obtained from a dealer supposed to be entirely reliable. It was not subjected to frequent bacteriological or chemical examinations, but it was not thought to have caused any trouble up to the period that I have mentioned. At this time observations made by Dr. Miller and myself were brought to the attention of the managers, who immediately interested themselves in the matter, and we now have a supply from an approved source, the milk being produced and handled under satisfactory conditions as to general cleanliness and care of the utensils and of the cattle, and kept properly cooled. It is not allowed to stand indefinitely on the station platform upon its arrival in the city, but is immediately delivered at the hospital. When it arrives there it is at once placed in a central distributing station, where it is kept at a temperature running always from 43 degrees to 45 degrees F., and never going above 48 degrees F., the temperature of the milk upon its arrival having always been previously taken and recorded. A graduate nurse is in charge of the central station and is responsible for it in all ways; for its cleanliness, the temperature of the milk, the distribution of the milk to the wards, the care of the vessels, etc. When the milk is received in each ward it is put into special vessels which are tightly closed. In each ward one nurse is responsible for keeping the milk properly cooled and clean. Bacteriological and chemical tests are frequently made and their results recorded. The chemical tests have always been entirely satisfactory, while the bacteriological have been most excellent. For months past the milk has been delivered at a temperature that was almost regularly below 50 degrees F., in a few rare instances going as high as 52 degrees, and since the regulations in regard to the temperature at delivery have been carefully complied with the bacteriological counts have been very low; almost always, indeed, within the requirements of the New York certified milk.

This milk costs a cent a quart more than that previously in use. When one realizes what an enormous amount of milk is used in a large hospital one cannot overlook the fact that an advance of more than 20 per cent. in the price is a considerable item in the yearly expense account. One can hardly doubt the advisability of undertaking such an expense, however, when one considers that in a hospital milk is the chief article of food; that it especially is the main food of the patients that are seriously ill; and that it is, at the same time, much more likely to be contaminated with pathogenic organisms and to become a flourishing bacteriological culture than is any other food, as foods are generally handled. When the last-mentioned facts are looked at fairly there can be no question that good milk should be secured, if any is to be had, even if this necessitates retrenchment in other directions. The price that I have mentioned shows, however, that good milk can be obtained at a relatively small advance upon the price of uncertain or bad milk if some trouble is taken in the first place to determine that the dairy and the methods in use there, as well as the subsequent handling of the milk, are satisfactory, and if these points as well as the chemical, and particularly the bacteriological, condition of the milk be kept under supervision in order to determine that the dealer is carrying out his contract with honesty and intelligent care.

I have insisted upon the importance of hospital action in this matter because the public is accustomed to look to hospitals to lead in hygienic advances, and the hospitals cannot afford to shirk their duty. The road to a general sanitary milk supply does "lead up hill all the way," and the way is a very long one, but many of the rough places would be smoothed away at once if the administrative officers and the attending staffs of a large proportion of hospitals took definite and determined action. The courage that this would lend to the general cause; the immediate warning that it would give to all sensible milk dealers that they must look to their methods with care or soon be left in the rear, and the ultimate benefit to sanitation, all these would be of an extent and importance that cannot be over-valued.

Together with the hospitals, physicians and veterinarians in country regions have a most valuable opportunity to act as leaders in this cause. A good deal of the evil that now exists is due to the ignorance of most farmers as to the fact that there are evils and as to the methods by which conditions may be improved without great expense. Doctors of medicine and of veterinary medicine who practice in the country could, by quiet suggestion, do much to increase the knowledge of the producers concerning these points.

I have made no special reference to the literature concerning the epidemics of disease that have resulted from milk infection, or to that discussing the differences between sanitary and unsanitary milk and the practical methods of producing the former. References to the most accessible and valuable articles on these questions may readily be found in Freeman's tables;[1] in the recent excellent collection of literature by Plaut,[2] as well as in articles in the same publication by Glage, Sieveking, Rosatzin and others, and in the extremely striking monograph by Kober.[3] The latter contains, besides Dr. Kober's important article, a valuable description by Mr. R. A. Pearson of the essentials in the production of good milk.

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[1] Medical Record, March 28, 1896.

[2] "Die Milch und ihre Bedeutung für Volkswirthschaft und Volksgesundheit," Boysen, Hamburg, 1903.

[3] U. S. Senate Document No. 441, "Milk in Its Relation to Public Health."

MEASURES FOR THE RELIEF OF SYMPTOMS IN CEREBROSPINAL MENINGITIS*

By Francis Huber, M.D.,

OF NEW YORK.

Of the 112 cases treated at Gouverneur Hospital last year (all doubtful cases being excluded) 28, or 25 per cent., recovered; 5, or about 4 per cent., were discharged improved; a similar number unimproved, and the remaining 74 in number, or about 66 per cent., died.

Fourteen of the 28 recoveries, 12 per cent. of the total number of patients, were practically well inside three weeks. To be more exact, 10 had fully recovered in two weeks or less, 1 was discharged on the 17th day, the other three in about 3 weeks. In the remaining 14, 4 were well in 4 weeks, 3 in 6 weeks, 2 in 7 weeks, 1 in 2 months, 1 in 2½ months and 3 in 3 months.

The above figures are interesting inasmuch as we find that 12½ per cent of the total number of cases treated belonged to the mild type of the disease.

Now as to the fatal cases. During the first 23 days 56 patients died, 50 per cent. of the total number treated; from the 29th to the 230th day we lost 18. In the first five days 26 died, 23.2 per cent of the total number of admissions, or 35 per cent. of the fatal cases.

If we include the next two days we find that 32 deaths occurred during the first week, 28.6 per cent. of admissions and 43.44 per cent. of the fatal cases.

The deductions from the above may be tersely given as follows: "The mildest cases require no treatment; the malignant react to none. Medicine, with all its resources, is neither capable of combatting the attack nor responsible for its results."*J. C. Wilson.*

In *American Medicine,* April 1, 1905, Stockton reviews the treatment of the disease. He confessed, and we must agree with him, that the sanitarian is more useful than the therapeutist. The various improved methods suggested in different epidemics are discussed in a brief and lucid resumé: "When we recollect the difference in virulence in different epidemics, it is easy to understand how faulty notions as to the effects of measures of treatment may gain credence."

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*Read before Pediatric Section (Academy of Medicine), May 11, 1905.

In considering the treatment in detail and in estimating the value of any plan certain factors must not be lost sight of: (*a*) the large proportion of malignant cases, (*b*) the grave character of the anatomical changes, and finally, (*c*) the great irregularity in the clinical course.

It is impossible to predict the subsequent progress from the initial symptoms. A mild onset may be followed by severe and grave symptoms. On the other hand, a stormy invasion, in a few fortunate instances, may be succeeded by a rapid decline of symptoms and an uneventful convalescence.

An apparent convalescence is frequently interrupted by an unexpected recrudescence or relapse. Severe and apparently grave manifestations may be cleared up unexpectedly.

In the absence of a specific remedy or antitoxin (which would have to be employed early) the treatment is symptomatic.

To secure the necessary rest of mind and body, aside from the possible danger to others, in private practice the case ought to be isolated and placed in charge of a good nurse, in a well-ventilated room. The room need not necessarily be kept dark; a bandage over the eyes serves the same purpose. In Gouverneur Hospital the children have been isolated in two large rooms since March, 1904.

The general nutrition must be sustained by an appropriate fluid diet: milk, broths, soups, cereals with milk, eggs, cocoa, orange juice, etc. An ice-bag to the head, with proper support to head and neck, will add to the patient's comfort; raising the head of the bed 6 to 8 inches appears to afford relief. Plenty of water is to be given, and the body functions in general must be regulated. Constipation is overcome by enemas or saline laxative. The urine may require to be drawn off during the early stages. (The ordinary rules applicable to a severe febrile condition must be observed.) The nasopharynx, frequently the seat of catarrhal conditions, ought not to be neglected.

Warm salt solution, 6-10 of one per cent., slowly poured into the nares by means of a spoon improves the breathing, and in a measure prevents the tongue and mouth from becoming dry and parched. During the early stage, when swallowing is difficult because of a paretic condition of the pharyngeal muscles, and later on in chronic cases, forced feeding through the nose or mouth may be indicated. If convulsions occur, chloral per rectum, chloroform inhalations, and in severe cases, morphine hypodermically are required. Trismus is rare, and does not continue long.

Pain and restlessness must be relieved by codeine or morphine per os or hypodermically. Phenacetin, with or without codeine, relieves the headache, etc. Bromides have been recommended for the same purpose. They are less efficient, disturb the stomach and give rise to a fetid breath.

For vomiting, cracked ice, rest of stomach for several hours, small hypodermic of morphine are indicated.

Ergot in the beginning has been greatly praised. Severe vomiting in the later stages is relieved by lumbar puncture, small hypodermics of morphine, ice to epigastric region and careful dieting. Sodium benzoate of caffeine in appropriate doses subcutaneously affords prompt relief in cases in which pulmonary edema occurs. Adrenalin is also of use in this state.

Packs or baths (90, 95 or 98 degrees), with or without mustard, relieve the irritability, improve the general circulation and frequently promote a quiet sleep. They lessen the muscular spasm and rigidity in general.

The method of Aufrecht initiated in 1894 has been extravagantly lauded. M. Roganský published remarkable results, claiming 66 per cent. recoveries. Hot baths at 104 degrees F. (an ice bag being supplied to the head) were administered for 15 to 20 minutes once or twice a day. It is claimed that they restore consciousness, calm the delirium and restlessness and relieve the pain. The temperature, vomiting and rigidity were not affected to any extent. The method is worthy of a trial, and has given us good results. Alcohol, ammonium carburet, tincture valerian and spirit ammonia aromatic are indicated in the typhoid conditions and in stage of exhaustion.

"Lumbar puncture is not a procedure for the careless or the novice. It demands skill, cleanliness and judgment."—Elsner. Lumbar puncture, apart from its diagnostic value, is of service, as it relieves the intracranial pressure to a certain extent. It is necessary to repeat the procedure at intervals, particularly in chronic cases. In our hospital cases the first puncture is usually for diagnosis. A small amount only is withdrawn, say 6-8 c.c.; later on larger amounts are taken away, 20-30-40-60 c.c. To influence the intracranial pressure, from 10-15 c.c. must be removed. Be careful not to remove more than 20 to 30 c.c., unless evidences of pressure are pronounced.

Lumbar puncture with injections of various antiseptics has not yielded very brilliant results.

Each case presents its individual indications. The strength of the patient must be maintined by appropriate nourishment and skilled nursing. Nourishment and nursing are of the utmost importance, particularly in the protracted cases. After the acute stage is over the whims of patients may be gratified, and more generous diet is allowed with advantage. The use of crede or mercurial ointment along the spine has not met with any appreciable success. In the typhoid state alcohol is indicated and well tolerated. In chronic hydrocephalus K. I. internally in small doses and lumbar puncture may prolong life. Surgical interference may possibly give better results in appropriate cases. Ch. hydrocephalus (internal variety) necessitates auto drainage by method of Taylor, ch. hydrocephalus (external and internal), repeated tapping at intervals of a few days.

The iodides are indicated with a view of causing the absorption of plastic exudates. Hypodermoclysis given early to overcome the prostration and initial shock, and possibly to dilute the toxins, later on to supply fluids to the tissues, has been of considerable value.

Local bleeding by leeches has been resorted to largely before admission to the hospital, without appreciable benefit.

In view of the interest excited by the antitoxin treatment, a few remarks may be in place:

"That branch of bacteriology which deals with the mutual antagonistic relations of pathogenic germs is still in its infancy. The facts already discovered suggest important developments in the future. To what extent clinicians will be able to utilize these antagonisms in the treatment of disease it is difficult to foretell."

In the editorial (*Med News,* March 4, 1905, page 409) from which the above extract is made Coley's work with the toxins of the bacillus erysipelatos and bacillus prodigiosus in the treatment of inoperable sarcoma is instanced. It is also stated that

Metchnikoff's important data have not yet received practical applications. He has shown that the bacillus mesentericus, the bacillus subtilis and the bacillus of symptomatic anthrax weaken the toxins of the tetanus bacillus. The bacillus of Eberth destroys the toxins of diphtheria.

A further contribution to the subject, and one which induced Dr. E. Waitzfelder and other clinicians to resort to diphtheria antitoxin in treating cerebrospinal, was made by Dr. A. J. Wolff of Hartford. He found that there is a decided antagonism between the Klebs-Loeffler bacillus and the meningococcus, and during the course of the study on this portion of the investigation found that pure cultures of the meningococcus were killed by antidiphtheritic serum, and not only precipitated when mixed with the latter, but active bouillon cultures, when mixed in bulk with the antitoxin, are precipitated in the same manner.

The results obtained at Roosevelt Hospital, in the services of Drs. Peabody and Jacobi, have not tended to confirm the enthusiastic reports of the beneficial effects observed at Gouverneur Hospital. After a careful trial the procedure did not impress those who had studied the cases as having influenced the disease to any degree. The intraspinal use of the remedy did not yield any better results. The latter method was tried in the children's service at Beth Israel Hospital, and was given up because of the negative results.

An interesting observation is the following: A little girl 3¾ years of age, previously healthy, in good physical condition, was given an immunizing dose of 2,000 units at 2 P. M. (a suspected case of tonsillar diphtheria having occurred in the family). The next morning at 10 A. M. she was suddenly taken ill, became rigid, lost consciousness and vomited a number of times. When seen in consultation at 4 she was in deep coma, pulse imperceptible, deeply cyanosed, with numerous petechiæ over body, large quantities of grumous material were vomited. Tarry stools occurred. The profound coma and pronounced evidences of pulmonary edema made the prognosis absolutely bad. Death occurred at 8 P. M. In this case of malignant cerebrospinal fever, notwithstanding the fact that the antitoxin had been given 20 hours before any symptoms were noticed, the subsequent downward course was rapid. No untoward results followed the administration of a much larger dose in the other child with the infected throat.

INTUBATION EXPERIENCES[1]

By Wm. T. Watson, M.D.

READ BEFORE THE SECTION ON LARYNGOLOGY AND RHINOLOGY,
MEDICAL AND CHIRURGICAL FACULTY OF MARYLAND,
FEBRUARY 24, 1905

The first of my patients to be intubated was operated upon by Dr. W. D. Booker October 9, 1894. The tube was removed on the fourth day. The child breathed well for an hour or so and then rapidly closed up. By the time I secured Dr. Booker—some five hours after the tube's removal—the child was fighting hard for breath.

Ten months later Dr. J. W. Chambers was called by me in the morning to intubate a two-year-old child, but was unable to operate before 5 p.m. The physician and parents had several anxious hours, and the child's life was greatly imperiled.

These experiences determined me to do my own intubating. I read up on intubation, and resolved to get a set of instruments.

On October, 1, 1895, I was called to a case of laryngeal stenosis in an infant of ten months. It had been treated by a physician for pneumonia. A neighbor, seeing the resemblance of symptoms to those in a case in her own house, diagnosed it as "chronic croup." The physician accepted her diagnosis and also her suggestion to send for me, as she thought I knew how to intubate.

I tried to get someone to intubate, but without success. Dr. Chambers was occupied, but kindly offered to lend me his set of instruments and encouraged me to try to use them. I, however, procured a set for myself, and succeeded very well. I passed the tube into the esophagus two or three times, and finally landed it in the larynx. A large quantity of mucus was coughed up. Much to my dismay, the tube became obstructed and I had to remove it and intubate again. Dyspnea was relieved, but the child died 15 hours later. Antitoxin was not administered until three hours before death. I had advised its use at the time of intubation.

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[1] Maryland Medical Journal, April, 1905.

This was the beginning of the most satisfactory work I have done in my professional career. Provided it is within a reasonable radius from home, I hail with delight every call for laryngeal diphtheria. At a distance these cases are exceedingly troublesome.

In the past nine years I have intubated 109 children, or an average of one a month—just about enough to keep me in practice.

Antitoxin came into use in the spring of 1895—just 10 years ago—so that all my intubations have been performed in the antitoxin era.

ANTITOXIN CASES.

One hundred of my cases received antitoxin. In most of the cases the diagnosis of diphtheria was confirmed by culture, by membrane in the nose or throat or which came up during operation, or by the presence of the disease in other members of the household.

Of these 100 cases 78 recovered and 22 died.

Of the 22 fatal cases 13 were almost beyond hope when I saw them.

On several occasions I have been called to operate, but found the children dead upon my arrival. In several other cases I arrived just in time to get them into my statistics, but too late to be of any service save to make easier the mode of death. The neglect has sometimes been on the part of the parent, but more often upon that of the physician.

Eighty-one of these cases occurred in the practice of other physicians, and I had but little control of the time of intubation or of the amount or time of administration of the antitoxin. Of these 81 patients 19 died, or a mortality of 23.5 per cent. Nineteen of these cases were in my own practice. There were three deaths, or a mortality of 15.8 per cent. These percentages compare very favorably with those reported by other operators. In the pre-antitoxin days these figures would have been reversed—about 22 per cent. of recoveries and 78 per cent. of deaths. The mortality was greatly influenced by the age of the patients. But one-fourth of my cases were under the age of two years. Yet 60 per cent. of the deaths occured in this fourth. The younger the patients the less able are they to battle for breath and to withstand the diphtheria poison.

In the nine cases receiving no antitoxin the stenosis was due to the following causes:

One to measles (recovered), two to catarrhal laryngitis (recovered), three to diphtheria (two died), one to papilloma of larynx (recovered), one to a post-diphtheritic contraction (temporarily in my care), one to tuberculous lymph glands.

Of the three diphtheritic cases, one patient died a few minutes after intubation and before antitoxin could be administered. One died three and one-half days after operation. I advised the use of antitoxin, but, because the only culture made was negative, the attending physician would not use it.

The third patient got well without antitoxin. It was in the early days of the serum, and the child's physician did not then believe in it.

The ages of my patients have ranged from six months to twelve years.

In my six-months' case the larynx was normal and there was no difficulty in introducing the one-year tube. The infant had dyspnea, which was so great that for several days it could not nurse. It made a whistling sound with each respiration. Intubation afforded no relief. We suspected pressure from tuberculous glands, as there were several enlarged glands in the neck. The dyspnea gradually subsided. Six months later, when the child was a year old, it died of tuberculosis of the lungs and pleura, and the offending glands were located at the bifurcation of the trachea. They were the seat of an old tuberculous process.

In my 12-year-old case the tube appropriate to the age could not be introduced without force, so I used the eight-nine-year size. It was retained in spite of hard coughing. At the end of three days it was coughed up and the child was well.

In theory intubation is as easy as dropping a nickel in a slot. An aunt of one of my patients had this idea, for a niece having coughed up her tube, the aunt was on the point of trying to replace it when I arrived. She said: "It's just like putting a shuttle in a sewing machine and makes the same noise."

In practice it is often beset with difficulties, and I know of two instances in which the patient died during the physician's first attempt to intubate.

Improper Position.—One important source of trouble is improper position of the child, due to inefficient assistants.

Having the child properly held is essential to rapid and careful intubation. On two occasions in my experience the child was held by a drunken man. One of these men committed suicide a few days later while suffering with alcoholic mania. He really did better than some more sober but more nervous people, and took great pride in following the "perfesser's" instructions to the letter. The other fumbled and delayed the operation, which was, however, finally successful. I nearly lost one case because the mother who was holding the child fainted as I was operating.

Spasm of Larynx.—Spasm of the larynx proved to be a serious complication in one case. The moment my finger touched the larynx there was a complete apnea with intense cyanosis. The spasm relaxed very slowly. I tried repeatedly to intubate, but found the larynx tightly closed. I finally desisted and called in Professor Chambers, who encountered the same difficulty. He finally used more force than I dared to use, and the tube went into place.

Some degree of spasm of the larynx is frequently encountered during intubation, but it usually relaxes in a few moments.

Tube Too Large.—On several occasions I could not insert without force the tube called for by the age, but the next size smaller proved to be the proper one.

Vomiting of Food.—Vomiting of food is not apt to occur during the first intubation, for, as a rule, the child suffering from dyspnea has taken very little food. In a succeeding intubaion it may be a source of danger. In a recent case dyspnea reurned quickly after extubation. The child had just taken a bottle f milk and I could insert the tube only after several vomiting atcks caused by my fingers had emptied the stomach.

In another case the baby coughed up the tube just after ursing eight ounces of milk. Necessity for reintubation was most urgent. Attempts to intubate caused vomiting. By the time the vomiting ceased the baby was almost asphyxiated. I did artificial respiration, and in one-half hour the patient was breathing normally.

Struggles of Patient.—In some cases, especially in a second or later intubation, the child knowing what is coming and being in a more vigorous condition, will clinch the jaws until almost asphyxiated. In one case I was unable to operate until the child ceased to breathe. Artificial respiration was done, and the child in an hour was as well as ever.

Effects of Anesthesia.—One intubation under anesthesia proved to be puzzling. The child had been wearing a tracheal canula, the larynx being in a peculiar contracted condition following diphtheria. Dr. Blake, whose case it was, introduced the tube under anesthesia, but found there was complete apnea. Later on, while Dr. Blake was absent from the city, I had the same experience. We supposed that the lower end of the tube must be occluded by granulation tissue caused by the wearing of the canula. On a later occasion I had the same experience, but before removing the tube I made a digital examination of the larynx and found the epiglottis tightly applied to the top of the tube. I pulled the epiglottis forward, and respiration went on in a normal manner. I held up the epiglottis until the child awakened from the anesthetic, when she was able to breathe and swallow all right. Whether this would frequently occur under anesthesia I am unable to say, but it is an experience worth keeping in mind.

Pushing Down Loose Membrane.—Every now and then, after a tube is in position, the respiration is worse than before. If the tube is removed by means of the thread the offending membrane is pretty sure to follow. The membrane is more loosely attached in the larynx and trachea than in the nose and throat, and is readily detached. The specimens which I show—three casts of the trachea, and one of trachea, bronchi and bronchioles—were brought up in this way.

In my last case, February 5, 1905, after intubation the child breathed very well for 20 minutes. I then removed the thread. As I was preparing to leave, the child began to cough, when expiration became suddenly arrested with a clicking noise.

This meant loose membrane. I immediately extubated, and the tube was followed by a cast of the trachea.

Abnormality of Larynx.—In December last I encountered a peculiar and difficult case in a girl of three years. I tried a tube for a three-year child, then a two-year tube, and finally a one-year tube, but without success. I gave the child a rest, and then tried again with the one-year tube, but could not introduce it. The manipulations had increased the dyspnea. I then prepared to do a tracheotomy. When all was ready I gave the child a very little chloroform.

I made one more attempt at intubation, and was successful in introducing the three-year size by using just a little more force than usual.

The child revived greatly, coughed up a large quantity of the imprisoned mucus and then went to sleep.

The next day it had a temperature of 101 and respiration about 40, color good and no dyspnea.

The temperature record was not kept regularly. The respirations when taken were never below 40. The child died four days after intubation.

Autopsy showed tracheitis, bronchitis, and a consolidated lobe in one lung. Death was caused by pneumonia.

My especial interest was in the larynx, and here the cause of my difficulty in intubation was readily apparent.

The anterior wall of the larynx in the cricoid region was the seat of an ulcerative process which had destroyed the soft tissues and allowed a film of free cartilage to loop backward into the lumen of the larynx. Dr. MacCallum has kindly studied this for me, and regards it as an old process, and not due to a tube worn but four days.

I have here a vertical section of the anterior portion of the larynx, showing the ulceration,and the free loop of the cartilage in cross section. This finding fits in with the previous history of the case, which was that the child's respiration was always noisy since a few weeks after birth. It had a chronic cough, for which it had been taken to the Johns Hopkins dispensary on several occasions. At one time the cough was evidently regarded as due to some syphilitic lesion, as the infant was treated by mercurial inunctions. At another time it was thought to be due to an enlarged thymus. The thymus was not unduly large, and neither were the bronchial lymph nodes. It seems probable that the cough was due to this chronic ulcerative process in the larynx.

No membrane was seen. No cultures were made. No diphtheria bacilli were found in smears from trachea and bronchi.

Rapid Return of Stenosis.—In some cases almost complete stenosis returns immediately upon the removal of the tube, and it is in this class of cases where previous experience in intubation will make the difference between life and death to the patient. I have never lost a patient from this cause, but have come so near it that for several years I have not removed the tube without having another ready for immediate insertion.

In one of my prolonged cases, when the tube was coughed out, dyspnea was so urgent that I had to have two assistants dressed and ready to fly to their positions at a moment's notice day or night. A duplicate tube was always at hand. I was compelled to live in the house of the patient for five weeks.

In one case, in the suburbs, the tube was coughed up and the child suffocated before I could be gotten.

Where the stenosis occurs immediately after the removal of the tube it is probably due to swollen tissues above the glottis which fall together and prevent inspiration.

The gradual return of stenosis is probably due to edema below the glottis. This, fortunately, is the usual form of returning stenosis.

Retained Tubes.—This is the greatest bugbear of the intubationist. O'Dwyer used this term to designate "the necessity of continuing intubation long after the disappearance of the original disease (diphtheria.)"

After the use of antitoxin, the evidences of diphtheria rarely persist over a week, yet occasionally a tube which has been inserted during an attack of diphtheria has to be retained for weeks or months. I have had six cases which come under this heading: One of 17 days' duration, 4 intubations; one of 22 days' duration, 5 intubations; one of 35 days' duration, 5 intubations; one of 38 days' duration, 34 intubations; one of 42 days' duration, 3 intubations; one of 84 days' duration, 7 intubations.

All have made perfect recoveries. In two there was no membrane seen and cultures were negative. In one membrane came up during operation. In two no membrane was seen and no cultures made.

O'Dwyer believed that the cause of persistent stenosis following intubation in laryngeal diphtheria was almost solely due to traumatism; more often to improperly-fitting tubes, less often to laceration produced by inexperienced operators.

John Rogers, Jr., believes that retained tubes are due to a chronically-inflamed and hypertrophic condition of the sub-glottis tissues, which is a sequel of the original diphtheria inflammation, and not in any way the result of operative treatment. To this rule he finds but few exceptions. With this view I am inclined to agree.

Feeding is in most cases almost our sole concern after intubation and antitoxin. Children at the breast usually nurse very well. In children who take the bottle the Casselberry method should be employed. One infant a year old, whenever hungry, would throw his head back into the Casselberry position. In a recent case a child of four years still drank milk from a bottle. Twenty-four hours after intubation his physician telephoned that he could take no nourishment and was coughing incessantly. I traveled 20 miles by sleigh on a winter night just to stand the boy on his head. He drank a pint of milk immediately, and the cough was greatly ameliorated by the drainage of the mucus from the trachea into the pharynx. To older children I give almost any food suitable for a sick child. In only one case have I found food to enter the tube. In that instance it was partially obstructed by what appeared to be bread.

In two cases I had to resort to nasal feeding. It was easily done and exceedingly satisfactory.

Obstruction of Tubes.—In older children membrane which loosens up after intubation usually causes the expulsion of the tube, the membrane following it. In these cases the tube should not fit tightly. I have had several such cases.

At times the tube, instead of becoming suddenly blocked with loose membrane, become gradually filled with a granuar deposit—probably decomposed membrane. Here the tubes must be removed and cleaned. In one case I had to remove nd clean the tube three times in 17 days.

I have had but one death from an obstructed tube. This was a baby of eleven months. Thirty-six hours after intubation it was apparently well, when the mother saw it suddenly begin to struggle; in a few minutes it was dead. I found a tough piece of membrane wedged in the lower end of the tube. There seems to be no way of avoiding such an accident save to have a physician with assistants constantly in the room with the patient throughout the wearing of the tube.

Swallowing the Tube.—No serious results are recorded from this accident. When the tube is coughed out of the larynx it almost invariably comes into the mouth and is taken out by the nurse or patient. In one of my cases tube and thread were swallowed, and passed from the bowel 36 hours later without trouble. The tube had been in place but a few minutes. I left the child in charge of an assistant while I turned to attend to something. What happened I do not know, but when I was called the thread was just disappearing in the mouth. I grasped at it, but it eluded me and went on down.

After-Effects.—I have not recorded nor can I remember a case of paralysis in any of my intubated cases. In every case the voice has returned to normal. In a year-old baby which wore its tube 38 days there was an interesting psychic phenomenon. Before its illness it could say "mamma," "papa," "bye-bye," and other baby words, and could imitate the sounds of bees, and give an excellent imitation of the sounds made by a neighboring windmill. For the first few days after intubation it would attempt these sounds. Later on it abandoned all attempts. After the tube was removed it made no attempts to speak for about eight or nine months. It could laugh and cry in a perfectly normal manner, so I concluded that not the condition of the larnyx, but that of the mind was responsible.

Another little child became quite hysterical when it found its voice after wearing the tube five weeks.

In nearly every case I have been called to there has been no room for debate as to whether or not to intubate. The dyspnea has been so marked that immediate operation was called for. A good rule, whose author I have forgotten, is this: "When in doubt—intubate." Undoubtedly the early use of antitoxin will obviate the necessity for operation in a large percentage of cases. Still we must not expect too much of it. I have within a year seen a death caused from asphyxia because the physician had delayed operation too long in the hope that antitoxin would relieve the stenosis. I believe in early intubation, wherever there are stenotic symptoms, mainly for two reasons:

(1) The stenosis may become suddenly worse in the physician's absence.

(2) The tendency to broncho-pneumonia may thereby be lessened.

Sudden Increase of Stenosis.—It is surprising through what a small opening a child can breath in a normal way. A year-old infant can breathe nicely through a space the diameter of a match-stick. If such an infant shows signs of stenosis we know the lumen of the larynx is smaller than the diameter of a match-stick. To one who has watched in the pharynx the rapidity with which diphtheritic membrane can form it occasions no surprise to have such a larynx close up completely in an hour or two. A friend of mine, who has had a good many patients intubated, and is alert to the indications for operation, saw a child suffering with slight dyspnea. He paid a call in the suburbs, and then returned to his case of croup, only to find it moribund. I was called on one occasion to intubate a child. The symptoms were not very urgent. I did not have the tube appropriate to the age, so sent for one and returned in an hour. I found the house in confusion, and the child was said to be dying. Its pulse was feeble and fluttering. The chest heaved slightly a few times, but there was no respiration. In a few minutes the tube was in the larynx. The child made no resistance; it was like operating upon a cadaver. In a few seconds there was a slight respiration, then another, then a slight cough; then the respirations became stronger and more frequent. In half an hour the pulse and respiration were fairly natural. It seemed almost like a resurrection from the dead.

Broncho-Pneumonia.—Broncho-pneumonia exists in three-fourths of fatal cases of diphtheria (Holt), and in a larger proportion of cases where there has been involvement of the larynx, trachea or bronchi. It is thought to be due to the aspiration of bacteria from above.

In nearly every intubated case, where stenosis is mild or severe, a large quantity of mucus will be released. Air can pass through a larynx for many hours after the passage of mucus has been obstructed.

Sometimes many drachms of mucus are thus released. It must necessarily have filled the most of the trachea, bronchi and bronchioles. As it accumulates it must go deeper and deeper, and it seems to me must be a factor in carrying the germs which give rise to broncho-pneumonia.

Experience seems to have shown that at the end of five days is the proper time to remove the tube in cases where antitoxin has been used. By this time all membrane has usually disappeared. I am in the habit, if the child is taking food well, of waiting a day or two longer, with the hope that the tube may be coughed up or that the necessity for reintubation will be less likely to exist. With the modern hard rubber tubes I see no objection to this delay. With the old-style metal tubes it was advisable to remove them at the earliest possible moment because of calcareous concretions that would roughen them and irritate the tissues. I have on three occasions left hard rubber tubes in the larynx for three weeks, and removed them in a perfectly clean condition.

The greatest field for intubation has been for the relief of stenosis in laryngeal diphtheria. The use of diphtheria antitoxin has greatly narrowed this field in the following ways:

In the first place, the prophylactic use of the serum has greatly diminished the number of cases of diphtheria in general.

In the next place, inasmuch as most cases of laryngeal diphtheria are secondary to primary diphtheria of the nose, fauces or pharynx, the early use of antitoxin in the primary infection will prevent the secondary laryngeal involvement.

Lastly, in the cases where the larynx is involved, the early use of the serum will obviate the necessity for intubation in about 50 per cent. of the cases.

To illustrate how narrow this field has become, there were reported last year in Baltimore, which contains one-half the population of the State of Maryland, but 1,272 cases of diphtheria, of all varieties, or less than two cases to each physician.

Still, unless diphtheria becomes entirely stamped out, there will always be an occasional need for the operation, even in the practice of the most careful physicians, for cases of primary laryngeal diphtheria are often so insidious that stenotic symptoms are the first to attract attention. "Absorption of the poison by the laryngeal mucous membrane is very feeble as compared with that which takes places from the pharynx" (Holt), and the symptoms due to toxemia may not be present even when stenosis is far enough advanced to demand an operation.

In the last case I operated upon, the child played with her toys all the day and slept all the night (with the exception of occasional coughing spells) before the day of intubation. At operation a cast of the trachea was removed. Then there will arise cases of stenosis during measles, and even occasional cases of catarrhal laryngitis, that will require operative treatment.

Every general practitioner should be able to intubate, but the number of cases arising in his own practice will not hereafter be sufficient to keep him in practice, and it will doubtless mostly be done by a few to whom the cases will be referred.

EDITORIAL

HOURS OF SLEEP FOR CHILDREN

A recent issue of the *Lancet* publishes the results of a careful investigation into the hours of sleep allotted the younger pupils at forty of the great public schools of England, and others in this country. The author reaches the conclusion that in most cases in the former country a very inadequate amount of sleep is secured by this class of boys who need it most, and points out certain measures by which the defect could be remedied if thoroughly recognized. Although school conditions are very different in this country, where a comparatively small percentage of the population send their children away from home to the large boarding schools which parallel the "public schools" of Great Britain, still, those who have charge of the young people between the ages of twelve and sixteen will find pertinent matter in some of the contentions embodied in this article.

Obviously, in considering this question it is at once necessary to determine approximately the number of hours' sleep which a child of the age mentioned requires. On this point, disregarding for the present the personal idiosyncracies which frequently appear, medical and physiological authorities seem to agree that less than nine hours per day is something of a risk, and the opportunity for ten is advisable. Prof. C. S. Sherrington, the distinguished physiologist, condemns in no uncertain terms the attempt to confine young boys to the allowance of sleep which is sufficient for a grown person. He points out that the child's bodily life is run more expensively than the adult's; since bulk increases as the cube and surface as the square, the child has relatively far more body surface than the adult, and has in consequence to produce more body heat to maintain its temperature. The combustion in the child is more active than when growth has ceased. "During sleep the chemical processes are reduced, in the case of CO_2 output to one-fifth, so that the organism during sleep may be said to have its fires banked instead of being run under forced draught. But sleep is not only a respite from chemical change, it is a mechanical rest as well, which is of equal importance during the years of growth. The heart and respiratory mechanism require for their efficient working a rest period to their working hours. Most of a boy's growth in stature is done in bed, and there mental and physiological recreation goes on most effectively. Without plenty of sleep the activity of the waking day is like a house built on sand—in constant danger of breaking down and giving way." Prof. Sherrington puts the required sleep at the age mentioned at ten hours.

Sir James Crichton-Browne, whose study of over-pressure in school gives him the right to speak with authority, writes: "Sleep is more intimately connected with brain growth than with brain function. In the years of highest cerebral activity in adult life least sleep is required; in the years of low functional activity but rapid growth, most." Elsewhere he has written: "From birth, when the brain is growing rapidly and life is almost a continuous sleep, onward till manhood, when growth is at an end and when only a third of existence is given to sleep, the increment of growth progressively diminishes; and *pari passu* with this diminution in growth goes a reduction in the demand for sleep made by the system, so it might perhaps be said that eight hours in the twenty-four constitute the amount of reparative sleep needed by the full-grown brain, and that all sleep beyond that amount prior to maturity is germinal sleep connected with the processes of growth and development."

In view of these facts, it is obvious that to stint the growing child in the matter of sleep is to imperil the processes of development upon which his future happiness and usefulness depends. Yet there is little doubt that with most short-sighted wisdom many parents and teachers do encourage children between the ages of twelve and sixteen to adopt hours of study which seriously interfere with the desirable ten hours' sleep. The fact that the children themselves express no desire for more than they get is no argument whatever, for, like other bad habits, the habit of taking insufficient sleep is easily cultivated, especially by those high-strung, sensitive children who are apt to be ambitious scholars and prone to sacrifice to class advancement the very factor which they peculiarly need.

Contrary to the English conditions, the large boarding schools of this country aim pretty generally at long hours of sleep for their younger pupils, and it is in the home where the lesson pointed out by this article needs most to be taken to heart, if we would raise up the next generation with a sound, normal equipment of mind and body.

SOME OF THE NEUROSES OF EARLY LIFE

In the Wightman lecture, delivered before the Society for the Study of Disease in Children, May 19, 1905, Dr. Henry Ashby discussed both scientifically and sympathetically some of the neuroses of early life, further defining his subject as "the functional disorders due to a failure of coördination or a backward development of the lower nerve centers, and the minor mental abnormalities occurring in early life due to a lack of inhibition or a morbid sensitiveness of the higher level centers."

The author recognizes fully the difficulty attending the use of the term "functional disorder," since some would so classify conditions which to others would simply be an exaggeration of what is seen in every child when over-excited, tired or ill. But this is a difficulty common in the classification of disease where it is well-nigh impossible to draw rigid dividing lines, and there is an ever-ready refuge in the term "borderland."

Dr. Ashby believes that the unrest and excitement of the present day have told upon both men and women and upon their offsprings, and that a neurotic heredity is more common than ever before. To combat this heredity it is necessary to recognize it early in individual cases, and then to surround the child with wholesome and powerful personal influences.

Among the esential characteristics of neurosis or psychosis in a child the author notes the following: 1. Want of coordination in muscular movements, both reflex and voluntary. 2. Hyperesthesia of motor or sensory centers, a slight stimulus provoking a strong reaction out of all proportion to its strength. 3. Failure of inhibitory control over actions or reflex movements. 4. Exaggerated conscientiousness and contrariness. 5. Certain morbid habits not seen in normal children. 6. Tendency to *petit mal* and hysterical attacks.

At the very outset of life we may find difficulty in respiration and deglutition due to faulty coördination or to failure of inhibition, and later on the nocturnal bed-wetting, which persists in older children, "strongly suggests a developmental failure of the controlling nerve centers which coördinate micturition." Head-shaking, nystagmus and stammering are also grouped with this class, and are apt to be confirmed by habit. Another group of neuroses of the lower neurons, apt to occur in neurotic families and to appear early in life includes such diseases as spasmodic asthma, recurring fever and recurring vomiting.

Among the minor mental abnormalities associated chiefly with the higher centers we find that undue sensitiveness to impressions which is evident in some very young infants who wake at the slightest noise or discomfort. An excessive timidity throughout infancy and childhood characterizes these children: fear of strangers, fear of the dark and of all sorts of uncanny creatures with which their imagination peoples it. Occasionally they are also subject to hallucinations occurring in the daytime. Other children exhibit a contrariness difficult to manage, and apparently find their greatest delight in disobedience. This is often a passing phase, and less to be dreaded than a certain want of control over desires which lead the child to purloin toys, sweets, etc., without any sense of shame, and if not outgrown and *out-educated,* if the word is permitted, may consign him to the life of a criminal. In contrast with these are the children who exhibit a morbid dread of committing some fault, and even at times accuse themselves of those which they have not committed. All these abnormalities are unfortunate and require the most wise and tender care, but where such care is forthcoming and there is no evidence of *petit mal* the outlook for the future is still sufficiently hopeful.

The morbid habits which characterize some children are rather more serious, such as masturbation, dirt-eating, a tendency to eclampsia, marked destructiveness, impulses to scratch and bite, and cruelty to animals. In many cases where the children seem otherwise normal these habits are broken or outgrown with advancing age, but where they persist the future is none too promising.

The close relation of infantile convulsions, hysteria and the various forms of epilepsy is constantly emphasized in early life, and it is to be noted that slight fits with no complete loss of consciousness, merely a stumbling, perhaps, or the making of grimaces, are often regarded by parents as merely "tricks." These minor fits are often more or less under control of the individual, and children have been known to use them as a weapon wherewith to rule the family and accomplish their desires. A judicious ignoring, together with a sharp scolding and a little cold water, can often break up this tendency.

All these minor neuroses are warning signals which, if disregarded, may lead to disaster, but if taken in time and wisely treated, may result in no serious disability. The best "cure for the neuroses of the twentieth century child is hard work and hearty play, a simple and healthy life."

ABSTRACTS

The Cutaneous Abdominal Reflex in the Course of Typhoid Fever and of Appendicitis in the Child.—Dr. J. A. Sicard (La Presse Médicale, No. 3, 1905), refers to the fact of the neglect of the tendon reflexes in the course of general and infectious diseases, although they are carefully inquired into in maladies affecting the nervous system. He finds that, in the child, valuable information concerning the evolution of enteric fever and of appendicitis may be afforded by a study of the abdominal reflex. Although it is in children that the phenomenon is best observed, yet it is not satisfactorily investigated in very young children—those below two or three years—but rather in the older child or adolescent, whose nervous system, being more balanced, acts more definitely to an excitation. In the adult and old person, the cutaneous abdominal reflex tends to become dulled, and observation is also rendered difficult by the development of a layer of fat in the wall of the abdominal cavity. In a young person, when the finger is drawn rapidly over the surface, the abdominal wall visibly contracts. The author has noticed this phenomenon in forty-six cases of enteric fever. It was bilaterally modified in twenty-two, being either absent or greatly diminished, with rapid exhaustion. This condition persisted throughout the whole febrile stage, becoming normal at the time of, or sometimes two or three days before, the fall of temperature. In two cases the alterations in the phenomena were but transitory. In two the abdominal cutaneous reflex did not undergo any change. Unilateral absence of the reflex was but infrequently observed; it occurred usually on the right side. In the course of appendicitis the author has observed similar changes. In this malady it is more especially the reflex of the right which should be investigated. In the great majority of cases of moderate severity the phenomenon is wanting on the right side, while that of the left side remains normal. In four cases which recovered without operation, the author noticed unilateral absence (on the right side) of the reflex during the febrile stage, while the reflex rapidly reappeared during convalescence. In another case, in which there was high fever and threatening peritonitis, bilateral absence of the reflexes was observed. It is thus clear that the reflexes undergo marked changes under the influence of subjacent intestinal lesions. It is not the result of a single examination which is of importance, but rather the methodical and daily study of these reflexes in the course of enteric fever or of appendicitis. As regards the causation of these modifications, it would appear that they are the result of an irritation, probably in the locality of the intestinal lesion, which reacts on the nerve centers of the spinal cord, causing a peripheral disturbance of the muscular tone. In some cases the abolition of the phenomenon clearly depended upon a pathological muscular contraction, while in others it attended a flaccidity of the muscle which was not less pronounced. The author has also found the reflex to be absent quite apart from spontaneous or provoked abdominal pain. On the other hand, in two cases of appendicitis the reflex was unilaterally absent, concurrently with pain and acute hyperesthesia and defensive muscular contraction. The author remarks that it is singular to compare this abolition of the abdominal cutaneous reflex with other observations concerning the exaggerations of the tendon reflexes accompanied with clonic contractions of the muscles of the lower extremities and even Babinski's sign. The existence of an antagonism between the phenomena confers a very real interest and importance upon the pathology of the phenomena.

A Unique Case of Appendicitis in a Child Fourteen Months Old.—Glazebrook (New York and Phil. Med. Journ., March 11, 1905) says that at 10 a.m. the child, who had been playing quietly, was noted as having a severe rigor and being markedly cyanotic. The child cried with pain on movement; he improved somewhat after a little stimulant, but died three hours later with all the objective symptoms of pneumonia. The child, who had been an inmate of the City Orphan Asylum, had previously been healthy, with the exception of attacks of "wind colic," which yielded to domestic remedies. At the autopsy, the large omentum was found to be adherent to the vermiform appendix mid-way between the cænum and its tip. The anastomosis was firm. As a result of some contraction of the omentum, the appendix had been drawn upward; at the apex the omental adhesion was found. The distal end of the appendix was free and not adherent. To the left, and posterior to the adhesion, was a drachm of green pus escaping from a perforation in the appendix. In the appendix was found a black mourning pin, which had probably been swallowed some six months previously. The cæcum, according to Vallée, lies, in children, on a plane higher than the anterior superior spines, and the appendix is correspondingly higher. It is thus easy to understand why, in many cases, pain may be experienced at or near the diaphragmatic pleura.

Clinical and Therapeutical Observations on Some Cases of Tic in Children.—Drs. H. Meige and E. Feindel (Journal de Néurologie, Nov. 18, 1904). The four cases here recorded are all those of juvenile tic, and of common occurrence. The first case was that of a girl of eight, who was suffering from several varieties of abnormal movement. The history dated from about a month previously. The health was good, and the child was intelligent and industrious. No cause could be assigned for the appearance of the affection. Only one other case of the same kind had been observed in her school. The child constantly winked, sometimes on one side, and again bilaterally, and there was also an abnormal movement of the eyeballs—when the patient looked steadily at anything, the eyeball was moved abruptly to the right and left, and there was also a contraction of the muscles of the forehead when she was blinking or fretting for anything. She also bit and sucked the lips. All these movements ceased during sleep. The movements were more marked in the evening than in the morning, and also when she was at rest. Speech was very rapid—indeed, too rapid—and she often stammered. The authors observe that this was a mild case of tic in childhood, the patient being able to control the movements by voluntary effort. Stammering is very often observed in children the subject of these movements, or, at all events, an undue rapidity of speech. Such patients always seem in a hurry. This precipitancy is nothing more than the objective manifestation of a mental state. Stress is laid upon the occurrance of defects of speech in these cases. Such affections prove the closeness of the link existing between speech and tics. The effects of psycho-motor discipline are very marked in these cases. In the present instance treatment should include (1) the calling of the patient to order every time that a gesture or a grimace occurs; (2) the rising late and going to bed early, so as to get as much rest in bed as possible; (3) the removal of the patient from the school and her residence in the country.

The second patient was a girl of eight and a half years. In this case the first movement was that of shaking the head; later, a slight cough appeared, which was clearly of the same nature as a tic. Finally, the arms were affected, this being accompanied with an expiratory movement which was noiseless: the two arms were approximated to the body at the same time that the expiration was effected. At other times she struck the epigastric region with one or other fist. There was also grimacing and nibbling of the lips, but there was no winking. The movements affected both sides, but were more marked on the left. The child was in poor health, but she slept well, and had a fair appetite. She ate extremely rapidly. She was very fidgety, and always in motion. She was intelligent, but very capricious and preoccupied, negligent in dress and at her lessons. Noticeable are: (1) the abrupt movement by approximation of the two arms, accompanied with a short expiration. The question arises as to whether this is a case of superposed tics: tic of the arms and tic of expiration. The authors regard this latter as a secondary phenomenon, provoked by the shock of the elbows against the thoracic parietes. (2) The blows of the fist in the epigastrium. These are nervous movements of common occurrence. Like scratching, or sucking the thumb, they take their origin in a local sensation, which the patient tries to get rid of. In this patient it would seem that a pain in the epigastrium must have been the starting-point of this symptom. (3) The rapidity of eating. It is very necessary to call the attention both of the patient and of the parents to the danger of this bad habit. The treatment adopted in this case was rest in bed for at least a fortnight; later, exercise of constant vigilance, the patient being called to order whenever necessary. If the movements recommenced, she was to be again kept in bed. As regards the shaking of the head, the hat was ordered to be light and firmly fixed. Nine times out of ten a heavy or insecure hat is the cause of this symptom, so that the cure is a question of toilet. As concerns the nibbling of the lips, the child was constantly called to order, and, this not sufficing, a bitter ointment, such as one containing sulphate of quinine, was applied locally. Eating was carefully watched, and a certain definite time was imposed for the consumption of a dish. The respiratory tics were dealt with by the employment of respiratory exercises, combined with methodical movements of the arms, head, and mouth, carried out before a looking-glass.

Patient Number 3 was a girl of thirteen. It was noticed that an extremely great difference existed between the intellectual culture of the mother and that of the father. From the age of six months there had been a liability to gastro-intestinal disturbances (constipation, pain, etc.). When two years old she suffered from convulsions. The child is always constipated, and on the most trivial excess or defect of diet, or on slight exposure, she suffers from general malaise, fever, and delirium. The attacks only last a few hours. On several occasions she has walked during sleep. The child is very intelligent. About the age of six slight movements first appeared; grimacing was noticed, and in addition, eye movements and winking, slight strabismus, snapping of the jaws, frowning; a guttural sound was emitted from time to time; hitching of the shoulder and some movements of the arm occur from time to time. The child has a great dread of spiders; certain expressions are repeated. Irritation and the gastro-intestinal disturbance which had always been present are really the result of maternal weakness and of faults of feeding. Beyond a general want of motor equilibrium, the child suffered also from a visceral want of balance, so that in addition to a psychomotor line of treatment, a psycho-digestive treatment is also required.

PEDIATRICS

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ORIGINAL ARTICLES

HOW SHALL WE FEED AND TREAT THE BABY?

By Hermon Hawkins, M.D., of Jackson, Tenn.

The infallible rule in the treatment of a baby is: A properly constituted food suited to digestion, given in proper quantity at regular intervals.

Governed by this, you succeed where success seems impossible; with unlimited resources at your command, you fail without its application. There is but one ideal food, mother's milk. Sometimes this needs modification, as we will see later on. When unattainable, a substitute must be selected from the many recommended. Mistakes are dangerous, the selection often meaning a choice between life and death, or at the best, a choice resulting in a robust child, or one too feeble to start fairly in life. Decision must be based upon a comparison with the standard mentioned—mother's milk.

Its availability and price, the ease and accuracy with which it can be modified to the proportions of human milk, renders cow's milk fed by the percentage method the best universal substitute and the only available one which can be used permanently without damage to the child. In view of this fact, it is very necessary for us to know just what human and cow's milk each contain, in order that intelligent comparison and adjustment may be made. According to the latest figures published by Holt, an average human milk contains:

Fat	4.00 per cent.
Sugar	7.00 per cent.
Proteids	1.50 per cent.
Salts	0.20 per cent.

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*Read before the Tennessee State Medical Association. Nashville Tenn., April 13, 1905.

Water	87.30 per cent.

Bacteria—Sterile, or nearly so.
Reaction—Amphoretic, or alkaline.

And an average of cow's milk taken from herd consists of:

Fat	4.00 per cent.
Sugar	4.50 per cent.
Proteids	3.50 per cent.
Salts	.75 per cent.
Water	87.25 per cent.

Bacteria—Many varieties.
Reaction—Amphoteric, or acid.

By comparing these two tables, we readily see that if we dilute cow's milk with water until proteids are in same proportions as in human milk, add proper amount of sugar and fat in shape of cream to conform to the standard, render alkaline with lime water, bicarbonate of soda or potassium, and sterilize, the resulting mixture will approximate human milk very closely. But it is only an approximation—because the similar substance in the two fluids show chemical differences in their formation. Without consuming time to present exhaustively these chemical dissimilarities, let us briefly notice some grosser differences necessary for us to remember if we are to obtain the best possible results in practice. When acted on by the digestive fluids, huma nmilk coagulates in small, loose flocculi, easily digested, whereas cow's milk forms a larger, firmer curd, harder to digest. The alkaline substance we add to cow's milk delays the formation of this curd, and its firmness can be further lessened bp using a diastased cereal gruel to dilute with in place of water, yet the difficulty is only partially overcome. The next point I wish to impress especially is sterilization, why it is done, what we accomplish and the effect of the process employed. Human milk taken directly from the healthy breast is live milk and practically sterile when received into the stomach of the child. On the other hand, cow's milk normally contains several kinds of bacteria of the acid-forming variety, which, although non-pathological, yet by their action on improperly handled milk quickly render it unfit for food. This statement presupposes milk uncontaminated from the outside, something we cannot obtain in this section for reasons mentioned later. When sterilized milk is changed from a live or fresh food to a preserved one, it is open to the objections which prevail against any preserved food as an exclusive diet. Theoretically raw milk is undoubtedly best for a child, but in practice we are afraid to use it because of the lack of dairy control, therefore sterilized milk has come into general use.

The laity—and I fear many of the profession—should be taught what is really accomplished by the process of sterilizing, for at present the term covers a woeful amount of ignorance and culpable negligence.

No amount of sterilizing will make wholesome food for a baby out of contaminated milk. The amount of heat used in the process does not even destroy all the bacteria, nor does it correct any of the chemical changes which they have produced. Again, none of the spores of bacteria are destroyed in the process, therefore sterilized milk is not only as easily infected as raw milk, if carelessly handled, but if not properly kept, will in a short time develop new colonies of bacteria without any outside contamination. I recently noticed an advertisement of an apparatus designed to keep the baby's milk warm all night. Certainly a murderous invention, yet doubtless many are in use. In place of exploiting sterilized milk alone, we should bend our energies to the prevention of the infection and bacterial growth which makes sterilization necessary. While milk laboratories and municipal inspection are not available except in a few cities, yet we can accomplish a great work by the following method: Select some reliable dairyman and explain what you mean by cleanliness in milking and what is necessary to be done to render his vessels and utensils fit for the reception of milk. Impress upon him the absolute importance of cooling his milk rapidly to 45° at the dairy, and keeping it at that temperature until delivered, in sealed jars, to the consumer. Then if you will thoroughly train the consumer in the technic of preparing and keeping it, the process known as "Pasteurizing" will be sufficient. This consists in heating the milk only to 160°, which temperature renders it sufficiently sterile, while it does not produce the objectionable changes which we find result from sterilization at the boiling point. We have long advised heat to destroy germs in milk; let us begin to stress the use of ice to prevent their growth, for clean milk cooled immediately to 45° and kept there will not grow many germs to destroy.

We should also combat the common belief that the milk from one cow is best for the baby. Mixed milk from a herd is best, simply because it changes less, while the milk from one cow is subject to variation from day to day and even from one milking to another. In considering the modified feeding of cow's milk the question occurs: "Isn't it hard to work out the percentages?" I answer, "Yes," but this labor has been elaborately done by Holt, Rotch and others, and the tables furnished by them are easy to follow. As a fair working rule, I have found it safe to estimate the cream from good, rich milk which separates after standing six hours, at 12% fat, and make formulæ on that basis. At this point many mistakes occur. Should a mixture corresponding to the analysis of human milk fail to agree with the child, we are prone to condemn the method when we are at fault. We follow an average for our standard, forgetting that every baby is a law unto itself, therefore the printed formulæ should be used as guides to be changed to suit each case, always following the safe rule to begin with a weaker formula than you expect to use and strengthen it gradually. Have the baby weighed once a week, for weight is a better guide to quantity and quality of food than the age. Watch the stools to see how the food is digested, then change formulæ as these may indicate. A paper of this character would be incomplete without some reference to patent foods. Many of these are upon the market and if we accept the claims for them by the manufacturers, perfect substitutes for human milk can be bought from any druggist. Unfortunately, these claims are unconfirmed either by analysis or experience. Many of the best find a place as temporary substitutes, and so given are very useful, but none of them ALONE meet the requirements of a PERMANENT food for babies. To illustrate the application of what has been suggested, I present three cases. I have purposely avoided individual instances, choosing rather to take the more comprehensive method of describing types of three classes of cases constantly occurring in practice.

Case I.—This baby is six weeks old, breast fed and apparently healthy. It sleeps quietly in the morning, but towards evening begins to cry with colic and continues to suffer all night, until finally dosed to sleep with various mixtures by the frightened parents. The same experience is gone through with the next night, the only comfort offered the young mother being the statement that "the baby has three months' colic, which will continue the full time, but which cannot be cured." Finally the worn-out and discouraged parents send for you. You find the baby has been allowed to nurse every time it cried; that its bowels are constipated, stools showing curds, while the stomach seems weak, frequent regurgitation being a constant symptom. The mother confines herself closely to the house, at the same time is eating heartily of rich food. This is not a case for medicine, not even in the acute attacks of colic as a rule. These will usually be relieved by enemas of hot salt water with glycerine, and the application to the abdomen of flannels wrung out of hot water. The real cause is a transgression of the fundamental rule mentioned in the beginning of this paper. The milk is too rich in proteids and probably fats, and fed at irregular intervals; medicines will not correct either. Restrict mother's diet of meat and you lessen fats. Regular outdoor exercise to the point of fatigue will decrease the proteids. Enforce regular nursing every two hours from 7 a.m. to 9 p.m., then once between, with a teaspoonful of water or more, just before the baby nurses, and it will be surprising how quickly the colic will cease. Irregularity in feeding overworks and weakens the stomach and the relative strength of the milk varies with each feeding. If close together, it is concentrated, but diluted by longer intervals. Teach a baby its first habit, to nurse regularly. Insist upon waking it for its food by the clock, the first two or three weeks, in spite of protests from friends or nurses. Certainly exceptions are found in delicate and nervous children, but even these can be taught a fair degree of regularity by the exercise of good judgment and patience.

But occasionally, the child's digestion has been so weakened and the mother's prescribed walk is so interfered with, the plan fails. In that case, alternate the breast with an artificial feeding of low percentages, thus diluting the breast milk by the longer intervals between nursing and resting the stomach by giving it lighter work to do. This principal can be extended to taking the child from the breast temporarily, using a pump to draw the mother's milk, until it becomes better suited to the child's digestion. Rotch records a case which required several days of active horseback riding to render the mother's milk suitable for her child. This simple cause, while very common and usually disregarded, is important because it deals with the beginning of many serious conditions, and is suggestive of the means to be employed in the modification of breast milk.

Case II.—This is also a breast-fed baby, eight months old, well nourished and up to this time healthy. The weather is warm, yet the baby has cut two teeth without trouble and gums are swollen for more. Of late the mother has noticed it was restless and feverish, bowels moving frequently, foul, thin, yellowish, changeable stools streaked with green, containing curds of undigested milk. The trouble was supposed to be caused by the teeth and disregarded. These symptoms became suddenly more severe, the baby looked pale and weak, refused the breast, began to vomit often, fever suddenly increased to 103 or 104°—with intense thirst, restless, nervous, prostrated condition, stools more frequent and worse in character. The now thoroughly frightened mother sends for the doctor. This is an acute attack of indigestion with poisoning by the absorption of toxins from an intestinal canal loaded with fermenting material teeming with bacteria. Quick elimination is needed, not opiates. Wash out the bowel by a high enema of warm salt solution, using not less than a gallon, or at least enough until it returns by the side of the tube clear. If the vomiting continues, you will do well to wash the stomach also. Now give calomel in broken doses and follow with a laxative, preferably castor oil, in this case because of its secondary constipating effect. Sponge for fever and nervousness. If excessive peristalsis continues and you are sure intestinal canal is clean, just enough opium to control is admissable.

My personal expereience is, however, that opium is seldom needed and I rarely ever use it in any form with children. Just here most of our mistakes are made. We wash offending material from bowels, then allow child to take the breast and bring the whole condition back again. Digestion is very feeble, power of resistance much weakened and the digestive tract still harbors an excessive proportion of bacteria, only needing material upon which to grow. In the milk allowed has been furnished an excellent culture medium and the inevitable relapse follows. Twenty-four hours' starvation is best, allowing only small amounts of cool sterile water at frequent intervals. After a few hours albumen water may be substituted if the symptoms improve. Whey and cereal water may be added, allowing the child to nurse only a little when breast is permitted, preceding the nursing with a drink of water. As full nursing is gradually resumed, I have found ten or twelve drops of Fairchild's Essence of Pepsin just after each nursing will assist digestion. If a baby learns to drink water from a bottle when it is well, it will take it freely and easily the same way when it is sick—though it may refuse anything from a spoon. I always advise the mother to teach a baby to use the bottle for this reason and the custom has been very helpful to me. This attack was attributed to "teething," the common cause assigned to all digestive disturbances of children during that period. The irruption of teeth frequently does cause increased irritability, slight feverishness, disturbed sleep and a weakening of tone which renders the child more liable to attacks of indigestion. To this extent teething may have been the remote cause of the acute symptoms mentioned; but the general rule is that after prompt and intelligent treatment, the child recovers its usual health and in a short time the teeth come through without special disturbance. Surely evidence sufficient to cause us at least to eliminate everything else before we accept "teething" alone as responsible for the attack. It should also teach us to combat the tendency of most people to neglect symptoms of illness in babies simply because they are teething, for such neglect often results in unnecessary sacrifice of life.

Case III.—This baby weighed 8 pounds at birth. Its mother was young, healthy, had a normal labor for a primipara, from which she rapirly recovered, and the supply of milk was abundant. It seemed a good start all around. But like Case I, the milk did not seem to agree with the baby, which suffered from digestive disturbances. The physician in charge exhibited various and sundry drugs without relief. Finally he decided that the mother's milk was not suitable, and put the baby upon sterilized cow's milk, mixed in a haphazard way, allowing the mother's breast to dry up. The sterilized milk failing to agree, patent foods were tried and many medicines experimented with, but no improvement in the child. Several physicians were called in consultation, but no essential change in principles of treatment being instituted, the patient continued to grow gradually worse in spite of the variety of counsel. Finally the case falls into your hands and you hear the whole pitiable history from the worn, sad-eyed, young mother, who holds upon a pillow in her lap a three months old baby, weighing seven pounds in its clothing. The little hands are like the claws of a bird; its cheeks show some fulness, but the nose is pinched, the temples and fontanelles sunken, the eyes large and pathetic with suffering. The skin is a dead, cool white, tongue red and sore, the mouth specked with white patches, the thoracic skeleton outlined minutely as though under stretched parchment; the belly swollen, the skin on the thighs hanging loose like the sleeve of a coat, extremities cool, the cry a whine, sleep fitful and disturbed, with half-closed eyes; pulse quick, irritable and weak. It shrinks from a spoon but grasps the bottle eagerly, only to stop nursing in a little while, as though from exhaustion. The stools are frequent, foul smelling and undigested. You ask what food is being given, and the mother mentions some patent food, which she says disagrees like everything else tried. If you inquire about medicines, she points to a row of bottles on the mantel, mute witnesses of past failures. In the words of the street, "It is up to you, doctor, what will you do?" Follow in the footsteps of your predecessors, prescribe a new quieting mixture, select another patent food, tell the poor mother to mix it as per printed directions, try it a few days, and let you know the result? The result will be a funeral. This may come, but if so, let it come after you have fought a fight which will add to your reputation and prepare you to win next time. Scores of mothers who never knew you, know of this baby and will note each step. Boldly face a long struggle which will surely tax your resources, judgment and patience to the uttermost: demanding unwearied attention day after day to every detail along definite lines if you are to succeed against such odds. Death will conquer then, if you cannot have the intelligent, unwavering co-operation of the mother, together with family circumstances allowing moderate comforts and fair hygienic surroundings. Throw out no false hopes, but sustain the mother's courage and give her an intelligent idea of your methods. Be guided by three cardinal rules:

1st. Give a food which can be assimilated and give it at regular intervals.

2nd. Obtain the best possible hygiene of person and surroundings.

3rd. Give as little medicine as possible.

First, the food. This is the problem upon the solution of which success depends. Notwithstanding its former trial, cow's milk would be my first choice. Disregard age, let the strength of your formula be dictated by the weight and digestive ability of the child. Know the character of the stools, pin your faith on the scales used twice a week, counting stationary weight at first as gain, for you will find it a knotty problem to give the child food enough to sustain life, much less to gain in weight at first. Write your formulæ as accurately and vary to suit conditions as carefully as if prescribing powerful medicine. You have no time for experiments; start with very low percentages of proteids particularly and predigest the milk. I generally use Peptogenic milk powder by the cold process for this purpose. Increase strength of formulæ gradually. It is a question of what you can get, not what you want. This is the general principle and basis—time will not permit a minute description of specific conditions which may render advisable for a time the use of whey with cream, dextrinized cereal waters as dilutants, the addition of meat juices, or even the use of buttermilk prepared according to the German plan.

Second. Hygiene. In hot summer, this baby will have cool extremities. Supply the absence of subcutaneous fat by lightweight flannels, particularly over abdomen, with stockings on feet. The bath should be given with great care in a warm room free from draughts and with warm water. Following it, the body should be rubbed thoroughly with cocoa butter. The massage should be gentle but thorough, the limbs being stroked toward the body. Perfect cleanliness is essential. Diapers should be removed from room when soiled, and every precaution taken to keep the person and clothing of the child fresh and clean. Two light, airy rooms should be occupied alternately, if possible, the empty one being dusted and aired while the child is in the other. If in the summer, a shaded porch will be a big factor on your side if used.

Third. Medicine. Two drugs are nearly always demanded: the dilated toneless stomach and irregular peristalsis of whole intestinal tract will be improved by tincture of nux vomica, and in my hands it has proved the best tonic. My experience is positive as to the value of calomel in the digestive troubles of children. The safeguards are given only when indicated by the stools, in small, broken doses, followed by a laxative. Enemas are invaluable if used intelligently. Opiates I mention but to condemn, except in instances so rare they but prove the rule. Alcohol, in some form, bismuth, arsenic and iron may be added to the list, which may be increased by a few others, but medicines should be used sparingly, in small doses and only when indicated, and *none continued which disturb the stomach.*

This paper presents nothing new, nothing which cannot be found in standard text-books, but it groups rules and methods which I have tested and made my own practical experience in treating just such cases as these I have mentioned. Innumerable hints and useful details have necessarily been omitted in a paper of this length. My aim has been to arouse interest in the subject and to be suggestively helpful along lines which are thoroughly practical. I am satisfied if in the matter offered an answer has been even partially given to the caption of this paper: "How Shall We Feed and Treat the Baby?"

REFERENCES.

Holt, Rotch, Kerley, Fischer, Jacobi

THE TREATMENT OF DIPHTHERIA.[1]

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Rational treatment of disease must be based on a sound pathology and in a sufficient knowledge of pharmaco-dynamics.

In dealing with the treatment of diphtheria, it will further be necessary to realize that granting that a certain combination of symptoms and signs constitute a clinical entity—or disease which can definitely be termed diphtheria—so that there exist atypical or aberrant cases in which one or more or nearly all of the clinical symptoms and signs of typical diphtheria are wanting. These cases do not answer to the older text-book descriptions of diphtheria, but it is of the highest importance to the public health that their existence should be recognized in order that appropriate treatment may be adopted.

Bacteriology has altered the older views, and many cases must now be included under the term diphtheria which would formerly have not been so called. On the other hand, many cases which formerly have been termed diphtheria, on account of a visible deposit on the tonsil, can now by bacteriological assistance be excluded.

Yet in no instance in whic hthere is really room for suspicion should absolute dependence be placed on a *single negative* bacteriological result. It is quite possible for the diphtheria bacillus to be present in a throat or nose, and yet be missed by faulty manipulation of a swab, antiseptic treatment, etc.

To produce any pathogenic process of an infective nature two points are essential:

(1) A suitable infective organism.

(2) A suitable soil for its growth and for the production of its toxins.

This latter covers what is generally known as "susceptibility" to a disease.

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[1] Prize Essay of Practitioner. April, 1905

In diphtheria the infective organism generally finds lodgment on a mucous membrane, almost always in the upper respiratory passages. The organism may remain purely local, or it may be carried by the blood or lymph to the internal organs, such as the spleen and the kidneys, but in any case it is capable of forming a manufactory of its toxins wherever it may be lodged, *ceteris paribus.*

The local growth of the organism is generally accompanied by the formation of a membrane composed of fibrinous material, brokendown epithelial cells, diphtheria bacilli, etc. But it is the toxins which chiefly interest the therapeutist, for it is these which really cause the local necrosis, the destruction of red blood cells, the diminution of hemoglobin, the subnormal temperature, the subsequent paresis, the primary nerve degenerations, the fatty degeneration of the cardiac muscles and the degeneration of the cardiac nerve centers, etc., which form the pathological picture of advanced diphtheria.

The ultimate pathological conditions are analogous to those produced by serpent venom, but the diphtheria toxins act less rapidly. The analogy must be borne in mind in discussing treatment.

Another point is that, in a large proportion of cases of diphtheria, mixed infective processes have to be reckoned with. Streptococci, staphylicocci, pneumococci, yeasts, and other organisms are frequently found associated with Klebs-Lœffler bacilli in diphtheria, often leading to serious complications. In such cases treatment must necessarily be complicated and prognosis uncertain. Another important point is the relative susceptibility of individuals and families.

More immediately in connection with the treatment of diphtheria the names of Behring, Ehrlich, Aronson, Roux, and Martin stand out pre-eminent.

In the treatment of diphtheria the fact to be grasped beyond all others is this—directly there is a suspicion that a case might possibly be diphtheria, antidiphtheria serum should be administered without delay with proper precautions. Having done this first we may then have the suspicion of diphtheria confirmed or otherwise by bacterioscopic aid. Serum treatment should never be deferred pending a bacteriological report. If the bacteriological result is negative, the result of a single examination does not disprove that the case is diphtheria, whereas on the other hand, properly prepared antitoxin, if administered with proper precautions, can do no harm even if the case is not diphtheria.

With our present-day knowledge that diphtheria is practically rendered *non-fatal if treated with a suitable dose of diphtheria antitoxin on the first day of illness,* it is almost criminal to defer serum treatment until a bacteriological examination has been made.

Further, antidiphtheria serum not only has a specific effect on specific diphtheria, but also has been found to be of benefit in some forms of sore throat (particularly scarlatinal) in which repeated examination has failed to detect Klebs-Lœffler bacilli.

Seeing then that no harm results, and that the time gained is of incalculable advantage, 2,000 units of good and reliable serum should be administered subcutaneously directly there is a *suspicion* that the case might be diphtheria. Should the suspicion be confirmed by bacteriological examination, a further dose of 2,000 units can then be given, if deemed necessary.

A word of caution is necessary as to the mode of administration. The writer has seen letters, contributed to the medical journals by practitioners, advocating, on the extremely limited experience of three or four cases, the administration of diphtheria antitoxin by the mouth or rectum. Now Hewlett has shown by laboratory experiments how inefficacious such method of administration is. As a matter of common logic, it is evident that the varying chemical contents of the stomach must be prone to alter the chemical constituents of the serum before absorption can occur, and in any case such absorption must necessarily be delayed.

On the other hand, the subdermal method ensures speedy absorption, and the risks of chemical change are practically nonexistent. In desperate cases the advisability of large doses, administered intravenously, should be duly considered, but at so late a stage in this disease only a modified advantage could accrue, for the following reasons:

A large amount of toxin has already entered into combination with nerve and other tissue cells. Clinical experience seems to support Ehrlich's "Seitenkette" or "side-chain" theory of immunity. The great object of specific antitoxin treatment is to forestall the toxins and prevent them from combining with the body cells. When once toxins have combined with the tissue cells, antitoxin has but little neutralizing effect on those particular combined toxins. The late administration of antitoxin will, however, prevent the *further* absorption of toxins which, in severe cases, are still in rapid process of formation in extremely large quantities. Hence in severe cases large doses of antitoxin, administered intravenously (in order to gain a few minute or hours), are indicated to neutralize the large quantities of toxins yet uncombined, and which would surely quickly kill the patient if absorbed. But the patient may have even already absorbed a fatal dose of toxins. In such a case the antitoxin treatment would necessarily fail no matter what quantities of antitoxin were administered. The time for antitoxin treatment would have passed by.

I am of the opinion that the value of diphtheria antitoxin is almost entirely of a preventive nature by anticipating the combination of toxins with tissue cells. Hence diphtheria antitoxin in a limited sense belongs more to preventive than curative medicine. It cures a diphtheria patient when injected early, in an indirect manner, by combining with the toxins, allowing the phagocytes (which would otherwise be paralysed by the toxins) free play to wrestle with the invading bacilli.

It is all important that a sufficient quantity (at least 2,000 units) should be given on the first or second day of the disease. At any later stage, or if there is already pallor, or much membrane, a double or treble dose should be immediately administered in order to ensure the neutralization of the greater quantities of uncombined toxin which are then present.

Next to the specific treatment by diphtheria antitoxin, one drug stands out pre-eminently as specially indicated in diphtheira. The writer uses it largely and freely in every case of diphtheria he sees. It is strychnine. This drug is commonly prescribed in diphtheria in ludicrously inadequate doses. The write argues thus. In diphtheria we are dealing with a poison the results of which are directly antagonistic to the physiological action of strychnine. This diphtheria poison is being manufactured on a large and increasing scale (until antitoxin is administered), and must be met by correspondingly large doses of its physiological antidote. Accordingly, the author gives what some might deem heroic or even dangerous doses of strychnine in the treatment of diphtheria. To some children he has given nearly half a grain (0.03 grm.) of strychnine a day in divided doses during several consecutive days, followed by lessening doses for subsequent weeks. He has never seen any but good results. During 1904 he treated 32 cases of diphtheria without a death. During 1901, 1902, and 1903 he treated 147 cases with only 11 deaths, and 4 of these were moribund when they first came under treatment. During the last 4 years he has treated 179 cases with only 11 deaths, or a case mortality of only 6.1 per cent.

Such results justify a strong recommendation of an increased dosage by strychnine in diphtheria. In the early days of the disease the writer combines strychnine with the euchlorine mixture of Burney Yeo, chiefly on account of the cleansing and local disinfecting value of the latter. A few days later the patient is given a mixture containing tincture of perchloride of iron and strychnine. The perchloride of iron is another drug of immense value. In varying degrees it is antiseptic, germicidal, and blood-restoring. The use of this drug in diphtheria is almost universal, based chiefly, no doubt, on the affinity of iron for the protoplasm of the xanthocytes, by combining with the hemoglobin. But, in addition, iron has long been empirically used for a specific tonic effect in adynamic diseases such as erysipelas and diphtheria. Probably a considerable proportion of the explanation of its general tonic effects in these diseases is to be found in the chemical changes of the drug within the body, giving rise to free chlorine in small quantities acting as a general circulating antiseptic. The increase of iron in the hemaglobin also increases the oxygen-absorbing power of the red cells.

The necessity for *rest* in bed in diphtheria varies with almost each case. In a large majority of the cases, in which antitoxin is used on the first or second day, the patient can be allowed to get up in a week's time. There can be no rigid rule in this matter.

Color and pulse rate are the chief guides in determining the length of stay in bed after the disappearance of all membrane formation. In some instances the recumbent position is necessary for three weeks or more.

The *diet* in diphtheria, again, varies according to the individual case. In cases where there is much soreness of the throat, and generally during the early days of treatment, a milk diet is indicated, allowing also beef-tea, etc., and an egg beaten up every day. In most cases the child is ready for ordinary diet in three or four days' time, when he is at the same time placed on the iron and strychnine mixture.

To what extent is albuminuria a contra-indication to a generous diet? The writer's experience is that cases, early treated with antitoxin, do not develop albuminuria. In any case, unless the urine is very scanty, he does not consider diphtheritic albuminuria contra-indicates a dietary containing one egg and half pint of beef-tea daily. Albimunuria is, however, a contra-indication to chlorate of potash as given in the euchlorine mixture. In these cases it is well to place the patient at once on iron.

The value of raw meat-juice in severe diphtheria is perhaps not sufficiently appreciated. The writer has found it of great value in severe cases with marked pallor and deficient hemaglobin. It is a very useful aid to iron in this respect. Constipation, if present, is perhaps best met by calomel in small doses followed by a saline or senna.

Complications are rarely if ever seen in cases treated early with proper doses of reliable antitoxin. If no delay has occurred in seeking reliable medical advice, diphtheria ought to be an almost non-fatal disease. But where delay or mismanagement has allowed the golden opportunity to pass, the well-known complications of diphtheria may still be met with.

For the various forms of paresis no treatment will compare with large medicinal doses of strychnine. If there is a threatening of cardiac failure, absolute rest in bed must necessarily be enjoined. The writer does not advocate the use of digitalis unless the pulse is very rapid. Digitalis is apt to upset the digestive organs; moreover, it is of questionable value in any case in diphtheria. Not so with strychnine, which is of high value as a heart-supporter as well as a general nerve tonic. Strychnine is also a powerful antiseptic, and it being possible to give this drug in such considerable relative quantities in diphtheria, no doubt permits of its antiseptic properties also having some effect. Strychnine also tends to arrest any constipating action of the iron so freely prescribed in diphtheria.

Strychnine has a great affinity for nerve cells, more especially the motor centers; also the respiratory center, the cardiac center, and the vaso-motor center. These are the very parts which are attacked by the diphtheria toxins with a directly opposite effect. Hence in many ways strychnine is a direct physiological antagonist of diphtheria toxins, and is, in the writer's opinion, more successful even than diphtheria antitoxin in ousting or neutralizing those diphtheria toxins which have already entered into combination with the nerve cells.

Except in those instances where diphtheria begins as an intralaryngeal affection, it is comparatively rare to meet with laryngeal complications in these days of enlightened treatment. Hence the occasions for resorting to tracheotomy for the relief of laryngeal obstruction are less frequent. Personally, although the writer has treated nearly 200 cases of diphtheria during the last four years (including a few laryngeal cases), he has not had to resort to tracheotomy in a single instance. Large and repeated doses of antitoxin, with the temporary use of a steam tent, have hitherto speedily relieved obstruction in a few hours, even when there had been marked retraction of the intercostals and epigastrium, with the other well-known croupy symptoms. In the writer's opinion, tracheotomy ought never to be performed until time has been given for the effects of anitoxin, unless the case is so desperate that it is only a question of a few minutes before suffocation must ensue.

The writer has had no experience of intubation as an alternative to tracheotomy. *Prima facie* intubation would appear to be preferable, if one or the other was absolutely imperative, because a cutting operation, which is sometimes difficult or awkward, is thereby avoided; but intubation requires a very considerable amount of manipulative skill, which can hardly be acquired by a general practitioner with very rare opportunities of practising the operation. Nasal feeding is ocasionally required in the severer cases of pharyngeal diphtheria.

Rhinitis is a frequent complication of diphtheria. It is indeed so frequent that nasal discharge may be looked for in at least 75 per cent. of severe cases. Ocasionally the nasal septum or the post-nasal fossæ are the nidus of the affection, while the pharynx may be unaffected. These nasal cases of diphtheria are of supreme importance, but unfortunately are often overlooked. In any case of sore throat it should be made an invariable custom to inquire into the condition of the nose. A thin nasal discharge or an excoriated nostril is extremely suspicious.

In every case of diphtheria affecting the air passage, it is wise to institute four- or six-hourly antiseptic douchings of the nasal and pharyngeal passages. It is advantageous to ring the changes on such solution as Hydrag. Perchlo., 1-1000; Lysol, 2 per cent.;

Formalin, ½ per cent.; Permanganate of Potash, etc. A useful method at times is a nebulising spray. A solution of Menthol in Toluol and Alcohol can be conveniently used with a nebuliser. Lœffler's solution is—Menthol, 10 grm.; Toluol, 36 cc.; Liq. Ferri Sesquichlorat., 4 cc.; abs. Alcohol, 60 cc.

In conclusion, there can be no doubt that the treatment of diphtheria is best carried out at an infectious diseases hospital, but where it is decided to treat the patient at home it is necessary to bear in mind all that is meant by complete isolation of the patient and of his nurse, also the value of free ventilation of his apartment, etc.

As these apply to infectious diseases in general it is not deemed requisite to specify the requirements in detail here.

PRIMARY TUBERCULOUS MENINGITIS

WITH REPORT OF CASE[1]

By H. W. CHENEY, M.D., CHICAGO

Inasmuch as all the authorities agree that tuberculosis of the meninges and brain is almost always secondary to a tuberculous process elsewhere in the body, I have thought that the narration of a case in which the inflammation seemed to be primary in the meninges might be of interest.

Holt says in his book on "Diseases of Children"—It is doubtful if this form of meningitis *ever* occurs as *only* tuberculous lesion in the body and he has never failed at autoposy to find other lesions. The different works on pathology such as Ziegler, Stengel, Delafield and Prudden, and Hektoen all say, that, *nearly all* cases are secondary or metastatic in origin. Jacobi in his article in Keating's Cyclopedia does not even mention the possibility that the disease may be primary. Osler, alone, admits that in a few instances it has seemed to be primary. In a review of the literature in English for the last twelve years I have been unable to find a case definitely reported as a primary meningitis. A number were reported as apparently primary but no autopsies were held so they are ruled out. Simon of Nancy is quoted[2] as reporting autoposies on twenty-seven cases, in twenty-five of which there were other tuberculous lesions and he is of the opinion that the disease is always secondary.

Of course, the interesting question is, how the bacilli gain access to the brain. In this connection a recent editorial in the *Journal of the American Medical Association*[3] is pertinent. This authority says, "It is a mistake to assume that infection of the tissues must occur at the point where the bacilli enter the body and that hence a food tuberculosis should show intestinal lesions and that an inhalation tuberculosis should always start in the lungs. We *now* know that the bacilli can penetrate the tissues without producing recognizable changes and may infect *first* the regional lymph glands; they may even enter the blood directly through the thoracic duct and may produce the primary lesion in any part of the body. It is perfectly possible therefore to have a primary tuberculous meningitis, or synovitis, or osteomyelitis, with no other tuberculous lesion existing in any other part of the body."

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[1] Read before Chicago Pediatric Society, May 23, 1905.
[2] Boston Med. and Surg. Jour., 1894, Vol. 131, page 636.
[3] Jour. A. M. A., April 29, 1905, page 1370.

In support of this statement I wish to report the following case, which also illustrates another feature often present in this disease and that is, the extreme difficulty of making a diagnosis in the beginning stages. This child was sick two weeks before the symptoms were clear enough to make a positive diagnosis. The history is as follows:

Alexander A., boy, three and a half years old, had never been sick previously and was the picture of health. One paternal grandmother and one paternal uncle had died of tuberculosis. His parents both living and healthy, and being intelligent people had taken particular care as to his diet, exercise in the open air, etc., so that he was apparently as normal and healthy as a child could be.

I was summoned first on Feb. 3, 1904, when the parents complained of the child's vomiting. One week before he had indulged in some popcorn, causing a temporary gastro-enteritis which cleared up in a day or two. When I saw him he was vomiting two or three times in the twenty-four hours, mostly after taking food. Temperature and pulse were normal and further examination was negative, so I suggested a modification of his diet by giving him the more easily digested foods and drink and prescribed a laxative first, and then an intestinal antiseptic mixture.

On the *third* day there was little or no improvement, but the treatment was continued.

On the *fourth* day vomiting was more pronounced and occurred each time after feeding. The mother also noticed a slight lassitude or disinclination to move about, manifesting itself more by his wanting to be held or by sitting by himself quietly or lying down more than usual. His reflexes and pupils were normal and as yet no other symptoms appeared.

On the *fifth* day ordinary food was withdrawn and he was fed a predigested beef preparation and the intestinal antiseptic and corrective continued. His temperature ranged from normal to ninety-nine degrees and his pulse about eighty, with no irregularity.

By the *seventh* day the vomiting was persistent. At times it occurred spontaneously and it did not always follow the taking of food. All nourishment by mouth was now stopped and feeding by the rectum begun. Regular enemas of peptonized milk were given and most of these were retained. Temperature now reached ninety-nine and one-half at times, pulse still not affected. Pupils normal and reflexes negative. Inactivity slightly more pronounced and a greater inclination to sleep.

Dr. Frank Walls saw the case with me on the seventh day and after a careful examination we were unable to make a positive diagnosis. The possibility of a meningitis was discuessed but the symptoms were not definite enough at this time to confirm its presence. Dr. Walls advised an expectant and symptomatic line of treatment.

During the *second week* the conditions continued the same with the *persistent vomiting* and the inactivity of the child as the prominent features. There was no change in the reflexes or pupils. No headaches nor tenderness of the head or neck. Abdomen not noticeably flat. Pulse regular. Temperature below 100 dgrees. Examination of heart and lungs negative. No twitchings of the muscles or convulsive movements. Toward the end of the second week, however, the drowsiness and lassitude had become marked.

On the *thirteenth* day, the case being still puzzling and doubtful, a well known neurologist of this city was called in consultation and, after examining thoroughly, it was his opinion that there was *no meningitis* present. The vomiting he explained on the theory that it was cyclic in character and the weakness and lassitude of the child as being due to a lack of proper nourishment.

On the *fourteenth* day drowsiness had increased almost to coma. Pulse and heart action slightly irregular. Pupils at times unequal. Occasionally there was a slight contraction of the cheek muscles hardly to be distinguished from a smile. Knee jerk was slightly increased.

By that time I was pretty well satisfied that the case was tuberculous meningitis and, on the *fifteenth* day well marked twitching of the face and hands was present and the *first general convulsions* occurred so that the diagnosis was not quite clear. Dr. F. S. Churchill examined the case with me on that day and several times afterward and his notes have been of assistance in the subsequent history. Our examination at that time showed the child comatose

—neck slightly rigid and tender. Throat, lungs and abdomen negative. Pupils irregular and unequal. Occasional nystagmus and slight strabismus present. Heart action and pulse irregular, varying from seventy-two to thirty-two. Temperature ninety-nine and one-half. Respiration twelve—somewhat irregular and yawning. Patellar reflex increased. Kernig and Babinski sign absent. A blood count showed: Hæmoglobin ninety-five per cent. Red cells 5,760,000; white cells 8,000.

From that time on the history was the typical one in these cases, with increasing weakness and coma and high temperature, and death on the *twenty-fourth* day. A lumbar puncture was done four times altogether, on the sixteenth, eighteenth, twenty-first, and twenty-fourth days and from one-half ounce to two ounces of fluid withdrawn each time. There seemed to be a slight temporary improvement after the first and third punctures and no changes after the others. The first specimen of fluid was clear, the others increasingly cloudy. The first was sedimented and the precipitate was small in amount, no tubercle bacilli or other bacteria were found in this specimen. A few cells were present which were largely lymphocytes—thus agreeing with some recent French writers who claim that the cells present in the spinal fluid from this disease are largely lymphocytes as distinguished from other forms of meningitis in which polynuclear leucocytes predominate. A guinea-pig was inoculated with some of the first fluid and died in seven weeks with tuberculosis of the abdominal glands, liver and spleen. Tubercle bacilli *were found,* however, in the sediment of the fluid abtained from the third puncture.

A careful autoposy was performed the day after death by Dr. H. G. Wells of the University of Chicago. On opening the abdomen there were no peritoneal adhesions. Retroperitoneal glands were normal. Mesenteric glands were slightly enlarged, no caseation. Liver, spleen, kidneys and pancreas all normal. In the gastro-intestinal tract there was no evidence of ulcers in the ileum. Heart normal. Lungs normal and no adhesions or consolidation in either side. Superficial lymph glands were not enlarged.

Brain and Meninges.—There was an unusually large quantity of fluid at the base of the brain. From the optic commissures posteriorly along the medulla was a gelatinous yellowish-white material. This was very dense about the infundibulum forming a solid mass five m.m. on each side. There was a dense mass around each anterior cerebral artery which seemed to invade the brain tissue. There was a slight granular exudite over the base of the frontal and temporo-spenoidal lobes and cerebellum but none over the upper portion of the brain. The fissures at the base and also the fissures of Sylvius were quite adherent. Along the arteries the membrane were beaded and studded with minute white spots. A similar exudite was between the cerebrum and the cerebellum and about all the fissures at the base. Both lateral ventricles contained a slightly turbid fluid. The membrane of the ventricles was finely granular but not thickened. The choroid plexus appeared normal. The bones at the base of the skull were perfectly normal. The fontanelles were closed and the rest of the skull quite normal.

Histologically—The meninges showed all the changes of a typical tuberculous meningitis. The parivascular tuberculosis was very extensive and chiefly consisted of caseous areas. Tubercle bacilli were found in stained sections. All other organs seemed perfectly normal except for some congestion and œdema in the posterior parts of the lungs. The *mesenteric* and *perebronchial* glands were normal.

Therefore; in view of the fact that the child had no symptoms of tuberculosis elsewhere in the body and that, the other organs failed to show tuberculosis either macroscopically or microscopically—I believe we are justified in designating this, a case of primary tuberculous meningitis.

THE REDUCTION OF MATERNAL AND INFANTILE MORTALITY IN PRIVATE OBSTETRIC PRACTICE*

By D. P. Rettew, M.D.,
of Coatesville.

In selecting this subject I do not assume that statistics, if they were available, would show a startling obstetric mortality, but it is within the memory of members of this society when they would. It shall be my effort to briefly review the methods which have brought about such a change and from the practice of which methods the general practitioner may hope to emulate the work of the best maternities and specialists whose obstetric mortality, according to a high authority, should be one-tenth to three-tenths of one per cent. This mortality does not refer to a maternity with an ambulance service where emergency cases such as eclampsia, placenta previa, ruptured uterus, etc., are sent in. These necessarily would give a much higher mortality. Many will say "My mortality is nil." Can they be sure that death of the mother a few or many months later was not the result of an infection at childbirth? Even other than pelvic diseases result from a lowered vitality due to that infection. Or, can they say that a puny, weak infant carried off at a few months could not have had a stronger hold on life had the mother and offspring had greater care in the crisis of delivery or during the puerperium? You will agree with me when I say that the greatest of all means in the past whereby parturition has been robbed of some of its terrors has been the law of asepsis promulgated by Lister and his followers. Even before Listerism, Semmelweiss in 1846 discovered and taught the principles of asepsis in the maternity wards of a large Vienna hospital, and made his name famous on account of a striking reduction in his obstetric mortality.

It is our privilege to-day to know how to be surgically clean; let us apply this knowledge to our obstetrical work. The emergencies are few and far between that preclude a thorough scrubbing of hands and forearms, and immersion from three to five minutes in bichlorid of mercury solution before the necessary vaginal examination. How often do we see the mistake of drying the hands on a dusty, or worse, a soiled towel after all this cleansing. Asepsis after and during delivery can be carried out in almost any house to which we are called, if the mind is trained to surgical cleanliness, as well as is maintained to-day in good hospital work. It has been recommended to change the outer clothing for a clean duck suit carried in the obstetric bag. The idea is a good one when we remember the kind of cases we often visit just before being called to a confinement case. Thorough cleansing of the external genitals, as few vaginal examinations as possible, and these only with disinfected hands, are measures to be recommended. When the labor is completed with the delivery of the placenta let us never forget by ocular inspection to be satisfied that no deep vaginal, or perineal tears not so deep, exist; and if they do, let us close them with a sterilized needle and sutures. At this point of his visit, after the application of the binder and a few general directions, the average practitioner has stayed as long as he can well afford, for other calls are often imperative. However, let him remain a little longer, and unless he has a skilled nurse in attendance he will often see an imperfectly cleansed patient and bed, and the ordinary nurse will apply to the patient some dusty, or some times worse, soiled muslin which has been recruited from the closet or bureau drawer. How easy it is in any house, if sterile gauze or cotton is not procurable, to sterilize old muslin for this use.

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* Read by title at the meeting of the Medical Society of the State of Pennsylvania, held at Pittsburg, Sept. 27-29, 1904.

A second important means of lowering our obstetric mortality has been the advice and care which the mother now receives during pregnancy. A prominent physician has recently said, "I thoroughly believe that if a pregnant woman whom we are engaged to attend, and having had the opportunity, we have not examined her urine for albumen, should be seized with a puerperal convulsion, we are morally responsible for that convulsion." We all know exercise, clothing, diet and the care of the breasts play an important part in the future health of both mother and child. It pays well in nearly all cases, and especially in primiparæ, to make at the seventh or eighth month an examination of the abdomen and a vaginal examination, if necessary, to determine the position and presentation of the fetus.

A third means which I sincerely believe helps toward our desired end, a minimum mortality, is the judicious application of the obstetric forceps. The indications and contraindications for the use of forceps I will not attempt to detail; suffice it to say that our infantile mortality has been lessened by their judicious and timely use, and mothers have been saved hours of torture and exhaustion, which is often followed with a long, tedious convalescence. Of a few things I would remind you: Always get the consent of the patient, her husband or some member of the family. Always be sure of the presentation, and if of the head, its position, which can be determined, if not by the fontanel, then with anesthesia and the insertion of the hand until the ear is found and the position thus determined. Always perform an aseptic operation, cleanse the patient thoroughly, and boil your instruments at least ten minutes. Never make the mistake of laying them on the bed or wiping them with a soiled or dusty towel, but keep them in the water until ready for use. One can do nothing better than to familiarize himself with the indications and contraindications for their use, and apply these to each case as it presents itself, thus having always a mental picture of how and when they should be used. Hirst has told us in his admirable work two good things worth repeating: "Never make traction except by the muscles of the shoulders and arms; a see-sawing or lateral motion or bracing the feet and using the weight of the body on the instruments is barbarous." After describing the position of the body, the use of the hands and the direction of the handles when the head is bulging the perineum, he concludes by saying: "Used in this way, there is no better safeguard for the integrity of the perineum than the obstetric forceps."

As a fourth means of approaching our low moortality I will mention version, and particularly podalic version. I believe a careful study of each case of difficult labor as to indication or contraindication for podalic version would, if undertaken early, place many cases in the domain of this humane and often brilliant procedure which are now left to hard, torturing forceps operations or craniotomy. In a series of some seventy cases during the year 1902 I did podalic version in about 12 per cent. for various indications, maternal and fetal, with no maternal and surely less infantile mortality than had forceps been applied to the same cases, where such would have been possible. Three of these operations were for the saving of the mother and child in puerperal convulsions; all the infants of the series were saved but one, it being a case of protrusion of arm and impaction of the shoulder. I am under the impression that with deep anesthesia, an empty bladder and rectum and a case with no positive contraindications, that the field of application for this operation is less limited than the text-books will allow.

I will close with a plea for a higher standard of obstetric practice, which will be appreciated by the laity, and insure raising of the beggarly fee now so commonly offered us by people better able to pay, and who should pay well for good work. I think if we ever need a higher, stronger motive for duty in this line we find it in an admonition from one of our own leaders, Oliver Wendell Holmes, who, closing his article on the contagiousness of puerperal fever in 1843, said: "The woman about to become a mother or with her new-born babe upon her bosom should be the object of trembling care and solicitude wherever she bears her tender burden or stretches her aching limbs. The very outcast of the street has pity upon her sister in degradation when the seal of promised maternity is impressed upon her. The remorseless vengeance of the law brought down upon its victim by a machinery as sure as destiny is arrested in its fall at a word which reveals her transient claim for mercy; the solemn prayer of the Liturgy singles out her sorrows from the multiplied trials of life to plead for her in the hour of peril. God forbid that any member of the profession to whom she trusts her life, doubly precious at that eventful period, should hazzard it negligently, unadvisedly or selfishly."

THE MEDICAL INSPECTION OF PUBLIC SCHOOLS*

By Wm. S. Chase, A.M., M.D., Akron, O.

The question of "Medical Inspection of Public Schools" is one which has not received, in this country at least, that serious attention from the profession at large to which it is eminently entitled. In my judgment, the most important advances in medical science during the next 50 years will be along the lines of preventive medicine. Much has been done in that great field since the work of Pasteur and Koch placed on a scientific basis the bacterial causation of many diseases, but scores of problems remain unsolved, and in their solution I venture the hope and the prediction that American physicians will not be overshadowed by their scientific confrères of France and Germany. With each stride toward a higher plane and with every sturdy effort to make medicine more of an exact science, the progressive physician is bound to become less and less a purveyor of pills and more and more of a medical advisor.

There is not a corporation of any note in the country which does not retain one or more representatives of the law to keep it out of trouble, as well as to look after its interests when trouble begins, but the families are few, indeed, that look for advice or counsel from the physician until trouble is well under way and then, in many instances, the physician is called several generations too late. I have no sympathy with that tendency of modern thought to belittle the province of the family physician, insisting that his days of usefulness are disappearing, and that in a few more decades everything medical will be in the hands of specialists. I cannot believe that day will ever come. There is so much along the line of intelligent work in the problems of preventive medicine alone for the broad-minded, conscientious, up-to-date family doctor to do, that he cannot cease to exist. His emoluments will doubtless always be small when compared to some of the more spectacular features of medicine, but his capacity for doing good work is well nigh limitless.

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*The Cleveland Medical Journal, Vol. IV, Feb., 1905. No. 2.

In this paper I shall attempt to support the proposition that by a well-regulated medical inspection of public schools we are advancing one phase of preventive medicine, and that only good can result therefrom. The public school system of our country is founded upon the well-grounded doctrine that the education there furnished will make of the boys and girls enjoying its advantages better citizens, better men and women. This apprenticeship, set down by the compulsory Education Laws of the State, as a prerequisite to full-fledged citizenship, presupposes on the part of those who enter thereon a physical and mental organization capable of standing the exactions imposed. It also presupposes that the child, having observed these requirements, shall emerge from this educational guardianship mentally and physically fit for the duties of civil life. Having assumed the duty of moulding the lives of future citizens, it is certainly self-evident that the State is morally bound to throw about its children of school age all the safeguards that prudence and caution may suggest, to the end that their physical and mental beings may not only not suffer from the duties imposed, but rather be benefited thereby.

W. L. MacKenzie, M.D., Medical Inspector of the local Government Board for Scotland, puts the matter well when he says: "It cannot be right to compel children to attend school, and wrong to make it possible for them to learn. It cannot be right to force their brains and wrong to correct their bodies. It cannot at one and the same time be right to compel the education of children and to perpetuate conditions of disease. It cannot be right to attempt the education of eye and ear when these are already known to be defective. It is absurd even from the educational standpoint, which is the primary concern of the State, to work these defective organs, chief feeders of the brain, as if their defects were indifferent. If a child is backward from defective vision, the remedy is to rectify the defect. If he falls behind because his ear-drum is perforated, he should at least be examined that his progress should not grow slower. If the brain is inactive from defective circulation, it is at least worth ascertaining whether the cause be want of food or congenital heart disease, or bad home conditions, or the supervention of some acute disease or of unhealthful conditions that will end in acute disease." It is unnecessary to call the attention of a body of medical men to the fact that if competent medical watchfulness is of value at any time, it is doubly and trebly so at the impressionable school age when the physical organism is so susceptible to all influences which may go far toward making or breaking a life of usefulness. Neither is it necessary for me to argue the point that if health inspection of any kind is to be of real value, it should not be entrusted to the teacher, however observant he or she may be, but to a competent medical man.

The general subject of medical inspection of schools naturally groups itself under three heads:—

First, and possibly the point on which most stress is generally laid, the detection and isolation of communicable diseases.

Second, the inforcement of sanitary surroundings.

Third, the detection and direction of the "physically unfit."

Boston stands first in the list of American cities to institute a medical inspection of schools. The first appropriation for that purpose was made in 1892, but interest and funds were at a low ebb the following year, and it was not until a severe epidemic of diphtheria swept over the city in 1894, costing several hundred lives, that sufficient provision was made to make the system efficiently operative. Years before some work had been done along these lines in a number of European countries, while Japan and even the Argentine Republic were ahead of enlightened America. It was in 1833 that France first passed a medical inspection law. The service was reorganized in Paris in 1878 and was placed upon its present footing in 1884. In Paris each medical inspector has under his general supervision 15 or 20 school-rooms. He visits each school-room at least once in two weeks and oftener if necessary. His salary is 800 francs per year. In Germany there is no uniform plan, but the usual custom is for the inspector to visit the schools in his district at least once a fortnight. Contagious diseases and visual and auditory defects are sought, and each pupil is measured and weighed periodically. These records are all kept on file.

Switzerland, so careful in every way to conserve the physical well-being of its citizens, has a system of medical examination of children and inspection of school buildings, instituted by the cabinet. The medical examination of children is prescribed on their first arrival at school. A child mentally deficient may be referred to a special class or a special institution. A child of insufficient development may be sent to Kindergarten, or the day of his admission postponed one year. The authorities have power to re-examine schools at any time. The Central Board of Zürich has instituted re-examination as regards sight and hearing for a number of years. To this has been recently added an inspection of teeth at the age of 12. The aim is to insure proper attention to eye-sight and hearing at the age of six; to eye-sight at the age of 12, when the eye begins to grow fast; to the heart at the same age for the same reason; and to the teeth at 12, since at this age decay makes rapid progress. Strict watchfulness is, of course, maintained for infectious diseases.

To illustrate the methods followed in Boston, the pioneer of American cities in this work, I quote in substance from a paper by Edward M. Green, M.D., Medical Inspector of Schools. Inspectors are generally selected from the younger men in general practice as they have the most time to devote to the work. The work has nothing to do with therapeutic systems, but requires simply the ability to make accurate diagnoses. The number of pupils in Boston schools is about 100,000. There were, when this report was made, 250 school buildings and 50 inspectors. This gives each inspector the supervision of about 2,000 children. They pay is only $200 a year. Children, if found ill, are not allowed to consult the inspectors professionally, but are directed to their family physicians, or, if poor, are referred to a proper hospital. An association of the inspectors has been formed and regular meetings are held to discuss questions pertaining to their work. The inspector sees only those children to whom his attention is called by a printed slip on which the teacher has noted the symptoms she has observed, or the complaints which the child has made. On each child's slip he records his diagnosis and advice. Questions of drainage, plumbing, heating and ventilation are not considered by the Boston inspectors, but are referred to special experts of the Board of Health.

The children who come under inspection are divided into two classes,—first, the subjects of contagious disease, where exclusion is demanded; second, those suffering from non-contagious, though perhaps severe disabling disease, or those who are mentally or physically below the normal standard. The inspector is always provided with culture outfits, supplied by the Board of Health, and takes cultures from all cases of acute pharyngitis and tonsilitis which he sees. After the culture is taken, the child is excluded until a report can be made on it the next day. If a case of contagious disease is discovered, the child's books are wrapped up in a bundle and sent to the Board of Health for disinfection or destruction, and the desk and seat are washed with a strong solution of corrosive sublimate or formaldehyd. If more than one contagious disease is found in a room, every child is sometimes examined by the inspector for several days in succession. He uses a narrow piece of pine wood as a tongue depressor in each case, and after use it is burned at once.

Much has been done in Boston in the matter of giving advice to individual pupils on the subject of proper clothing, food, exercise, and cleanliness. Inspectors are sometimes invited to address teachers of their schools and parents of the children on such subjects. In the early days of medical inspection in Boston, a striking lesson in personal cleanliness was taught, when a systematic inspection of the public school children was made for *pediculi capitis*. One-half of all the children of school age were found to be affected to a greater or less degree. Shower baths have been put into the basements of some of the new buildings and children are now allowed, and sometimes requested, to make a systematic use of them.

The result of a year's inspection of the Boston schools is shown in a report by Dr. S. H. Durgin, Chairman of the Board of Health:—

SUMMARY.

Specific infectious diseases	505
Oral and respiratory diseases	2,609
Diseases of the ear	87
Diseases of the eye	431
Diseases of the skin	3,421
Miscellaneous diseases	3,568
Found free from disease	4,952
Total	15,573

Number of pupils examined in the schools	15,573
Number recommended to be sent home	3,055
Number consultations with teachers (about pupils returning to schools, etc.)	3,440

I. SPECIFIC INFECTIONS DISEASES.

Diphtheria	23	Erysipelas	2
Scarlet fever	23	Syphilis	3
Measles	121	Tuberculosis	2
Whooping-cough	62	Malaria	4
Mumps	107		
Chicken-pox	108	Total	505
Influenza	50		

I wish to emphasize the point that the children suffering from the diseases enumerated were in regular attendance at the time.

Medical inspection of New York schools was begun in 1894. The system was extended to Brooklyn in 1898. In 1904 parochial schools and free kindergartens were added to the list. Medical inspectors are under civil service rules, and examinations embrace general medicine, physiology and hygiene, with particular stress laid upon the differential diagnosis of the infectious and skin diseases of childhood. Each inspector has five or six schools under his charge. He visits all of these once every day, seeing, in a private room, all pupils referred to him by the teachers, and once weekly makes a complete inspection of every pupil with a special reference to affections of the eye, ear, throat, head and skin. Cases of diphtheria, scarlet fever, chicken-pox and measles are excluded, and on report by the medical inspector all children supposedly suffering from these diseases are visited by a diagnostician of the Board of Health. In the lower part of New York a corps of nurses assists the medical inspectors and treats in school such diseases as impetigo contagiosa, ring-worm of the face, acute conjunctivitis, etc. The nurses also visit the poorer homes and see that treatment prescribed is properly given. This is done that the child may lose as little time from school work as possible. In 1903 the nurses gave 285,793 treatments, chiefly washing dirty heads, and made 24,000 visits to schools and tenements.

The new York inspectors are also obliged to visit the homes of pupils absent for several days without excuse. These visits from November 2, 1903, to May 12, 1904, resulted in the detection of 890 cases of contagious disease not reported. In no case does the medical inspector prescribe drugs; that is looked upon as the distinct function of the family physician. In 1903, 16,728 children suffering from trachoma were treated at the Gouverneur Dispensary, and 4,361 of these were operated upon. The number of visits made by New York Medical Inspectors in 1903 and 1904 was 62, 298, and the individual examinations made were over 6,000,000. The number of exclusions was 20,134, distributed as follows:—

Diseases of the head	8,040	Chicken-pox	160
Pediculosis	9,303	Whooping-cough	110
Eye	5,502	Measles	64
Skin	865	Scarlet fever	9
Mumps	501	Diphtheria	7

Previous to the establishment of New York's system of medical inspection, which is, I think, the most efficient now operative in any city of the world so far as the care of communicable diseases is concerned, epidemics of diphtheria, scarlet fever and measles were frequent and severe. Investigations showed that many children were allowed to attend school long before peeling had ceased. Many mild cases were not reported at all, were never seen by a physician, and children from the infected households attended school without any hindrance.

Detroit's experience with medical school-inspection is interesting. The experiment was tried in 1902. No funds were available with which to pay inspectors, and volunteers were called for. The number of schools first inspected in February of that year was four; in March, 26 more were added, and in May the total was increased to 50. In the four and one-half months of that school year, 10,554 examinations were made and 914 exclusions resulted for the following cases:—

Scarlet fever	11	Impetigo	24
Diphtheria	1	Whooping-cough	19
Tonsilitis	314	Chicken-pox	79
Measles	78	Pediculosis	151
Mumps	128	Other diseases	117

Out of 17,245 children examined in London in 1902, 18 per cent. were found to have serious visual defects.

In ascertaining the presence of visual or auditory defects so frequently unrecognized in children and so productive of serious results, no plea of mine for medical inspection can be half so forceful as a few figures on the subject taken at random.

Out of 600 children in the public schools of Glasgow between the ages of seven and 14, 166 were suffering from defective hearing. The physician making this examination asked the principal to select 70 bright and 70 backward pupils for further examination. Fourteen of the former and 28 of the latter were defective.

In New York 76 out of 570 children showed more or less serious impairment of hearing, only one of these being known to be defective by the teachers, and only 10 of the children were aware of anything wrong with themselves. Dr. Probst, Secretary of the State Board of Health, informs me that Ohio is in the rear column so far as medical inspection of schools is concerned; that the only cities which have done anything in that line are Cincinnati and Cleveland. I received no response to my letter of inquiry from Cincinnati. Dr. Friedrich, Health Officer of Cleveland, writes me that Cleveland expects to employ medical inspectors in the near future. These inspectors will be expected to pay daily visits to every schoolhouse, public and private, in their respective districts. The money has not yet been appropriated, however, to pay these inspectors and the project is still embryonic. The laws of Ohio, however, require the City Health Officer to inspect every school-house biannually, and ever since Dr. Friedrich came into office he has made a consistent endeavor to live up to that law, although with more than 400 school-houses to look after, the task, in connection with his other duties, has been a difficult one. His work, however, has greatly improved the sanitary condition of Cleveland school-houses, for they are now regularly scrubbed one a month, and every room is moistened and swept at least once a day. Formerly they were simply broomed, the dust being allowed to fly about and lodge anywhere. The windows in Cleveland school-rooms are now kept bright, and children are no longer obliged to sit facing a glaring sunlight.

That feature of medical inspection capable of demonstrating its practical utility in the most striking way and the feature appealing most strongly to the general public, without doubt, is that relating to the detection of contagious disease. To my mind, however, there is no branch of the subject so thoroughly charged with the possibilities of good as that relating to the discovery and intelligent direction of the physically unfit. It is unquestionably true that much of the disease, pauperism and crime appearing in after years is due to influences operative during the period of school life, and that much of it can be avoided by the early discovery and proper care of physical defects. For example, who can tell what the possibilities might be in reducing the mortality of that greatest of all scourges, tuberculosis, whose victims, each year, in the United States, number one-seventh of those dead from all causes, if each child of school age were to be put under the watchful care of men who realized the importance of good nutrition, properly functionating organs and good sanitary surroundings in making a fight against that disease? There is no question that neglected childhood is responsible for many of these deaths.

It is equally certain that our prisons, poor-houses, and asylums are filled with men and women whose main excuse for being there is that they failed to get an early start—a start that might have been granted them, had some early defects been discovered and remedied. The State of Ohio spends over $5,000,000 annually for the maintenance of its public charities—five times the income of all the colleges in the State. Should there not be some remedy for that condition of things? Cannot we, as medical men, contribute something toward the solution of such a problem?

I have no intention of claiming that the medical inspection of school children is the one sure way to solve these problems, but I do claim that it is a step in the direction of dealing with them rationally. To be sure the most urgent need for regular inspection is seen in the larger cities, but no town is too small to receive marked benefits therefrom.

I hope that at no distant day every town in the country may have its Board of Medical Inspectors, sanctioned by the Board of Education, and under the direction, if you please, of the Executive Officer of the Board of Health. I would have these inspectors give general attention to the sanitary surroundings, the detection of contagious diseases and the discovery of any defect militating against the health or future progress of the child, always being careful not to usurp in any way the province of the family physician.

DEATH IN A CHILD: STATUS LYMPHATICUS?

By Dr. A. L. Benedict,

CONSULTANT IN DIGESTIVE DISEASES, CITY HOSPITAL FOR WOMEN AND RIVERSIDE DRIVE HOSPITAL; MERCY HOSPITAL, BUFFALO.

The general subject of status lymphaticus and thymic asthma is so vaguely understood, that it is desirable to place on record even doubtful and incompletely studied cases. Undoubtedly, it is going too far to ascribe every comparatively sudden death in childhood to thymic disturbance, when that gland is prominent and when other explanation is not obvious. Still, in the present state of our knowledge, every possible case ought to be reported and such fallacies as appear in one such report, may, at least, call attention to the doubtful nature of other cases.

The present case was that of a Polish girl, aged five, seen late in the summer of 1904, in the steerage of an Atlantic liner. The past history was negative and, indeed, for the first few days of the voyage, the child had attracted attention for her good health and pleasing appearance and disposition. She was vaccinated on the second day of the voyage but, as she had been previously vaccinated, no symptoms occurred. The hygienic conditions of the steerage were excellent and the food supplied wholesome and abundant. Indeed, the only unfavorable conditions in the steerage of this line are the inevitable lack of perfect ventillation when the steerage is crowded and the impossibility of avoiding contamination from sputum, etc., in a class of filthy habits. The first of these factors was certainly not operative in this case, as the passengers had been on deck most of the days and the second had had no time to operate, unless we suppose the diagnosis of acute pneumonic infection without clinical symptoms in the original case.

About the fifth day of the voyage, the child, like many other passengers, was sea-sick but not enough to require medical attention, and she recovered so that in the evening she was playing as usual and the mother noticed nothing unusual at bed time. About midnight, the mother noticed that the child was lying in a peculiar attitude—just what could not be determined through an interpreter—and, on an attempt being made to arouse her, she seemed unconscious.

The child was carried to my room shortly after this, by an attendant who supposed that she had been given liquor. There was, however, no alcoholic odor and, on examination, the heart was found very weak and the lungs were quite uniformly dull, and gurgling, bubbling râles were everywhere present. The region of the thymus was protuberant but there seemed to be no mechanic interference with respiration. It may be remarked that the noise and thrill of a ship interfered with delicate physical examinations by percussion and auscultation but there was no question as to the diagnosis of advanced pulmonary edema and there was apparently no pneumonia. Stimulation by external heat, strychnine hypodermatically and ammonium carbonate was carried out, but with little hope of success and the child died at about four in the following morning, without return of consciousness or any change of symptoms.

After death, three lumbricoids issued, alive, from the nostrils and the question presented itself whether these might not have been responsible for the trouble. The entire absence of spasm, choking, sudden cyanosis, etc., and the frequency with which such worms are found in immigrants and even vomited on the deck, seemed to justify the conclusion that they had nothing to do with the pulmonary condition.

Cranial injury was also thought of, especially since falls are relatively common on shipboard during rough weather. There were, however, neither external marks of injury nor localized paralysis, pupillary inequality nor other indications of focal cerebral lesion.

Gross poisoning did not seem at all likely, either from social or medical indications. Alcoholism and other odorous poisonings could be distinctly excluded and the symptoms were not characteristic of any ordinary poisoning.

Among the endogenic poisinongs, uremia was excluded by the entire absence of anything pointing to renal failure. The urine could not be saved for examination and, indeed, thorough analysis would have been impossible under the circumstances. There was no indication of alimentary intoxication, beyond the moderate sickness amply accounted for by the motion of the ship.

Necropsy was suggested but the Captain decided that it would be inadvisable for various reasons. All things considered, the diagnosis of status lmpyhaticus with thymic origin, seemed most satisfactory.

SOCIETY PROCEEDINGS

CHICAGO PEDIATRIC SOCIETY

A regular meeting was held May 23, 1905,

President, Dr. SAMUEL J. WALKER, in the Chair.

Dr. J. W. Vanderslice read a paper on "Meningitis."

Dr. H. W. Cheney read a paper on "Primary Tuberculous Meningitis, with Report of a Case." See p. 623 PEDIATRICS.

Dr. Robert A. Black reported a case of "Purpura Hemorrhagic, with Meningeal Symptoms."

These three papers were discussed jointly.

DR. FRANK S. CHURCHILL stated that if he understood Dr. Vanderslice correctly, he said too much importance should not be attached to the Kernig sign, because it occurred in other conditions. He asked Dr. Vanderslice in what other conditions it occurred so frequently? We could not be sure of Kernig's sign, especially in babies, without careful investigation. For instance, last winter in many cases in his service at the County and Presbyterian Hospitals, where they had sick babies with intestinal trouble, with meningeal smptoms, in searching for Kernig's sign they would apparently get it, but after following it up for a minute or so, it was found that the child would relapse and this sign would entirely disappear; whereas in the cases of meningitis he had seen at some time or other, the Kernig sign was almost invariably present.

With regard to Dr. Cheney's case, there was no doubt about the diagnosis of tuberculous meningitis. He was somewhat surprised that more importance was not attached to the vomiting by the neurologist who saw the case, because this was notoriously one of the most frequent and one of the most suspicious signs in the early stages of tuberculous meningitis. If a child was vomiting without apparent cause, after careful investigation, one should always consider the probability of tubercular meningitis, and it was somewhat surprising that this possibility did not occur to the neurologist who was an exceedingly careful man. This emphasized in the speaker's mind the importance of pediatrics as a specialty, because the gentleman in question was not a pediatrician, and saw many more adults than children, and if he had seen as many children as he had adults, the speaker thought he would have attached more importance to that sign.

Last winter a case was brought into the Cook County Hospital of a child much older than the one reported by Dr. Cheney. The patient was nine or ten years of age. The only symptom the child presented at first and for several weeks was vomiting. The child eventually died of tuberculous meningitis.

A breast-fed baby was brought to his service at the Presbyterian Hospital on account of persistent vomiting, the assumption being that the breast milk was at fault. No trouble was found with the breast food. The child was taken off the breast, but still vomiting persisted in spite of all sorts of modifications of milk, and eventually it developed mild meningeal symptoms. Several lumbar punctures were made, neither of which showed positive results. The child died of meningeal symptoms. No autopsy was allowed; but Dr. Dodson was of the opinion that it was tuberculous meningitis. Vomiting, without apparent cause, should have a great deal of importance attached to it.

An interesting point in connection with Dr. Cheney's case was the occurrence of lymphocytes in the spinal fluid obtained by the first lumbar puncture. This agreed with some of the observations that had been made, and was more characteristic of tubercular meningitis than the simple variety.

The case described by Dr. Black was more than suggestive, as undoubtedly it was one of cerebro-spinal meningitis with the purpura spots so frequently found in these cases and which gave the disease its name. The fact that the spots occurred before the meningeal symptoms came on did not necessarily exclude the possibility of its having been a case of meningitis. He thought a lumbar puncture would have been extremely valuable in this case, as would have been an autopsy, which one could seldom get.

Dr. John C. Cook had not seen in his professional career more than twenty-five or thirty cases of cerebro-spinal meningitis of the epidemic variety, and perhaps not that many, but he had never seen a case of purpura among them, and while the case reported had some features of it, it might be a new phase of so-called spotted fever. He saw one case of meningitis during the past winter, although it was not of the epidemic variety, so far as he could make out. The patient had some symptoms of so-called spotted fever, in that the circulatory disturbances would disappear on pressure and reappear in different parts of the body, although it was not like a typical case of purpura. Although the child died apparently of meningitis, he thought there was no doubt that the final cerebral symptoms were the result of a hemorrhage into the brain rather than of inflammatory action, as soon after the purpura reappeared, after the child had made apparently a good recovery, it relapsed; the limbs were quite movable, and the Babinski sign was not constantly present till towards the last. The child was taking its food well. As soon as one or two spots appeared on the surface of the body, the cerebral symptoms began, followed by marked and continued convulsions until the child died.

DR. FRANK X. WALLS saw the little boy, whose case Dr. Cheney reported, about the seventh day of the illness. At that time the boy was in a darkened room. It was late in the afternoon when he saw him. Among the prominent symptoms was that the boy had changed very materially in disposition. He wanted to be alone; he did not want anybody to disturb him. In attempting to examine him he was not able to do much of anything with him, as he would not permit one to come near him. He would throw the bedclothes back, and he could only examine him by having someone hold him. Examination was fairly negative of one-half of the organs of the body. The boy had only been in bed a few days. He was taken out of bed, and was asked to walk. He staggered markedly, more than one would expect from weakness alone. His temperature was not high, and there did not seem to be any great wasting at the time. They thought there was a good deal of ataxia about his gait. There was a marked change in the disposition of the lad, as previously he was fond of strangers and wished to make up with everybody. They were rather inclined to think that the case was one of meningitis, and so informed the family. The speaker went away at that time, and on his return two weeks later asked Dr. Cheney how the case was, and he replied that the thought the child had meningitis. The case, he thought, might well be called one of primary tuberculous meningitis—primary in the sense that after a careful examination there was to be found no focus that could be considered as a primary one in the usual organs where one found tuberculosis in children, such as the lung, the bronchial gland, the intestines, or intestinal glands, although there might be some unusual focus in some bone or joint where the tubercle bacilli might have gained entrance, or into the testicle.

The value of spinal puncture, he thought, was not emphasized sufficiently by Dr. Vanderslice, when he stated that the diagnosis might be made by a careful examination of the fluid, and stated that the fluid was clear. The speaker believed that in tuberculous meningitis the fluid might be as clear as spring water, and hought this was the rule in early meningeal tuberculosis for the fluid to be perfectly clear, without the least bit of turbidity, which might appear if the fluid stood some twenty-four hours. In examining the fluid by bacteriological tests, or submitting it to culture r inoculating animals with it, one oculd find in the clear fluid ubercle bacilli.

Again, in the tuberculous cases something might be gained y the manner in which the fluid came through the trocar. In any cases the fluid would spurt through the canula some disnce, showing there was considerable tension, which he did not ink would be present in a normal exudate, so that the appearance of the fluid might be of great value in certain cases. In the epidemic form of the disease the fluid might look creamy.

In the case he saw with Dr. Cheney he examined the pupils to see if he could find Skeer's sign, but saw nothing unusual in the pupils, nothing that looked like an exudate or infiltration. The pupil was inclined to be dilated, and sluggish, and when exposed to a bright light it contracted slowly, then dilated again.

Dr. Vanderslice, in closing the discussion on his part, said, with reference to Kernig's sign, the fact that one did not get his sign did not in any way change the diagnosis of meningitis. Although Kernig's sign was usually present in these cases, he thought the advocates and adherents of the sign did not claim it was present in more than 80 per cent. of the cases; that it might occur in any of the cases of pseudo-meningitis, following any of the acute infectious diseases, as pneumonia, enterocolitis, etc. Cervical opisthotonos was a common symptom, and given cervical opisthotonos, constipation, and sighing respiration, he thought one could make a diagnosis of meningitis. Although Kernig's signs was an aid in diagnosis, the fact that it was not present did not exclude the diagnosis, nor would the presence of Kernig's sign enable one to make a diagnosis of meningitis.

Dr. Black, in closing the discussion, said it was his intention to have made spinal puncture in the case he reported, but in the morning when he saw the child was resting easily, he thought it would be better to put it off. Subsequently the child went into convulsions, and before they could resort to spinal puncture it died. The case started first with a purpura, and the meningeal symptoms developed later. On the ninth day the purpura came out on the face; on the tenth day the meningeal symptoms started up again, followed by marked purpura, etc.

EDITORIAL

POLTOPHAGY.

From time to time for a good many years the joys and advantages of thorough mastication of one's food have been zealously advocated by various persons, and good-naturedly satirised by others. Mr. Gladstone's classic "thirty-two bites" was outdone by Mr. Horace Fletcher and others, and more recently the matter has been removed from its purely empirical basis by the investigations of Mr. Hubert Higgins, who reports his conclusions in the *Lancet*.

These investigations were directed to establishing an answer to the question, "Is man poltophagic or psomophagic?" Those two rather formidable words are merely dignified Greek expressions for "porridge-eating" and "morsel-eating," and the significance of the question lies in the fact that if man is poltophagic he courts disaster unless he reduces all his food to the consistency of porridge before swallowing it, whereas if he is psomophagic he may bolt his meals unafraid, nor quail before the quick-lunch counter.

Some years ago Sir Michael Foster wrote: "The adoption of the habit of thorough insalivation of food was found, in a consensus of opinion, to have an immediate and very striking effect on the appetite, making this more discriminating and leading to the choice of a more simple dietary, and in particular reducing the craving for flesh food. The appetite, too, is beyond all question fully satisfied with a dietary which had a total considerably less in amount than with ordinary habits is demanded." A logical reason for these advantages of poltophagy has now been discovered in the construction of the human palate and epiglottis, which belong to the type of poltophagists. In a review of Mr. Higgins' article, a contributor to the *Dietetic and Hygienic Gazette* says:

"For instance, the horse, which may be regarded as a typical poltophagist, has a soft palate which is thick and muscular, and extends centrally well down in front of the large and rounded epiglottis. This arrangement is, of course, well adapted to the swallowing of the long, fusiform, semi-solid masses with which it is called upon to deal. How closely the soft palate is related to the tongue and epiglottis in the horse is shown by the inability of that animal to breathe through the mouth. The dog, on the other hand, is a type of the psomophagist. In this creature the soft palate is a thin, translucent membrane, almost devoid of muscle fibers, which seems to serve no other purpose than that of a valve to close the posterior nares during the act of deglutition; the opening of the pharynx is large, and the epiglottis pointed and thin. The well-known fact that the dog laps water shows that it lacks the power of continued suction by the soft palate."

Mr. Higgins has recorded the movements of the soft palate in man in the process of deglutition, and believes that he has proven man to be by nature a poltophagist. The reviewer further says: "It is claimed that by the establishment of poltophagic habits of eating the appetite becomes well defined at the commencement of a meal and ceases definitely at the end; that is to say, there is no unholy hankering after nuts and wine and preserved fruits; there is marked increase in the pleasure of eating; the taste for simple food becomes pronounced, and preferences for particular chemical elements of the simple dietary are more defined; the feces are lessened in amount and become odorless; the large intestine becomes smaller, and the feces tend to remain longer in the bowel. In all cases it can be said that there is an extraordinary change in general health, much more joy of living, increased power of work, and freedom from the infinitely troublesome concomitants of chronic illness.

Undoubtedly some of the joy of living which awaits the disciple of poltophagy may be ascribed to the psychic effect which this may share with any other "ism," but undoubtedly, too, there is a sound physical basis for many of its claims, and it is to be hoped that they will be promptly and widely recognized, and that habits of poltophagism may be inculcated in the rising generation to such an extent that even the "nooning" at the country school may be a scene of decorous and deliberate mastication instead of the "wolfing down" that from time immemorial has cleared the way for fifty-five minutes of "hi spy" in sixty minutes of intermission.

PATENT MEDICINES AND CHILDREN.

Just now, when such a determined campaign is being waged against the patent medicine evil, and meeting with equally determined opposition, it is gratifying to note one definite and certain step, although possibly limited in its application. Under a decision rendered by the Commissioner of Internal Revenue every druggist who after December 1 of this year may sell certain so-called patent medicines having whiskey or other distilled spirits as the chief ingredient will be obliged to pay a special tax to the Government as a liquor dealer. The manufacturers will be obliged to pay the special tax imposed upon rectifiers and liquor dealers. This decision will apply to every compound composed of distilled spirits, even though drugs are declared to have been added thereto, when their presence is not discoverable by chemical analysis, or it is found that the quantity of drugs in the preparation is so small as to have no appreciable effect on the alcoholic liquor of which the compound is mainly or largely composed. The same ruling applies to every alcoholic compound labeled as a remedy for disease and contagion containing in addition to distilled spirits only substances which, however large their quantity, are not of a character to impart any medicinal quality to the compound.

Undoubtedly, ways may be devised to elude the letter of this law by many manufacturers who should properly come within it, but it is at least a definite step, and, judged by the protests which its promulgation provoked, it is likely to prove effective.

Heretofore the Department has accepted the statements of the manufacturers as to the ingredients of their wares, but it is announced that from now on this will be determined by the analysis of the Government chemists. By the first of December a list of the compounds subject to the tax will be prepared, and it is safe to say that among them will be found many "valued household remedies" which country general stores have kept upon their shelves, and which country housewives have administered to their confiding families on every occasion of ache or pain.

It is a familiar fact that the patent medicine evil has its stronghold in the country districts, and the habit is too often founded in childhood and infancy. Every mother has her own favorite nostrum, and on the occasion of illness in a neighbor's flock is sure to volunteer it. In one instance a woman was visiting a neighbor and had her eight-months'-old baby with her. The child was ailing and fretful, and the hostess administered a dose which she was "sure would do her good." The child slept so heavily after it that the mother became alarmed, and the volunteer doctor reassured her with the assertion that "William had taken lots of it," said William being her husky six-footer of a husband. As a matter of fact, the child recovered from the opiate, but it was purely by accident. In another case a devoted mother whose frail little girl suffered from the alcoholism of her father and his ancestors dosed the child for months with a popular preparation which has been widely advertised as a cure for catarrh, and widely used by alcoholics as a substitute for more obvious beverages in towns which have "gone dry" under local option.

Anything which can be done to unmask the true character of these preparations will assist in curtailing their baneful influence, and it would seem that the decision in question must accomplish this in a measure.

ABSTRACTS

Infant Feeding.—F. S. Churchill, Chicago (Journal A. M. A., May 27), discusses the embarrassments of infant feeding when breast milk is not available, and the unsatisfactory results of the common practice of diluting cow's milk with water in such cases. He summarizes practically as follows: Cases of difficult feeding in infancy are: 1, Those of fat indigestion; 2, those of sugar indigestion; 3, those of proteid indigestion. Each of these may occur alone or in combination with the others. Proteid indigestion is most common, but fat indigestion is also frequent. Each must be treated individually, the form of indigestion present must be ascertained if possible, and appropriate measures be adopted. The treatment is almost exclusively dietary; the fats and sugar can be regulated by varying the amounts of cream and sugar in the food. The composition of cow's milk, with its high caseinogen and low lactalbumen content must be remembered in treating proteid cases, the caseinogen must be cut down or eliminated, if need be, and the lactalbumen retained. This twofold object is attained by feeding whey. Increase in quantity and quality of the food must be made gradually. In conclusion, he suggests the desirability of careful study of artificially fed infants and publication of the results.

Pyloric Stenosis in Infancy.—Charles M. Scudder, Boston (Journal A. M. A., May 20 and 27), reviews the literature of pyloric stenosis of infancy, and describes the symptoms, diagnosis and treatment. He recognizes two groups, the subacute or chronic, and the acute fulminating cases. While most cases are fairly typical, in some the differential diagnosis is difficult, and a careful study of each symptom and the sequence and grouping of symptoms should be made till the diagnosis is reached by a process of exclusion. He has little faith in the medical treatment, and believes that the condition is practically hopeless without operation. The results of operations since 1898 show a saving of over 50 per cent. of the cases, of which probably all would have died if let alone. An analysis of the fatal cases shows that many of them were due to mistakes or errors of technic, too late operation, etc. The operation should be rapid, free from causes of shock, sepsis or hemorrhage, the parts to be handled gently and isolated outside of the abdominal cavity. The Loreta operation is condemned. Pylorectomy is too severe and pyloroplasty is not recommended save in exceptional cases. Some form of gastroenterostomy is best for most cases, but owing to the shortness of the infant mesentery and other reasons the anterior operation should be avoided if possible. The Finney operation of gastro-pyloro-duodenostomy may be suitable in some cases, or if not feasible, Köcher's gastroduodenostomy may be useful. After-care is of vital importance, and if possible an expert in feeding a baby should have charge. Absolute quiet is essential, and rectal feeding may be needed for a few days. Scudder does not discuss the etiology to any extent, but thinks that a congenital hyperplasia may occur and a spasmodic contraction of this, after birth, is frequent if not the rule.

Experimental Syphilis.*—In a recent scientific review of this subject H. W. Carey (Albany Annuals) says: It has long been recognized that in order to reach a satisfactory solution of many of the problems relating to syphilis, it is necessary first of all to find an animal susceptible to the syphilitic virus. The literature contians numerous records of experiments in which many species of the lower animals were innoculated with syphilitic virus with little or no success. Anzias and Turenne in 1866 claimed that they had produced syphilitic papules and mucous patches in a cat. The following year Legros and Lancereaux described syphilitic lesions in a guinea pig inoculated with a fragment of an indurated chancre. Then followed a series of experiments upon swine. Martineau inoculated a young pig with pus from a chancre durum and observed later a parchment-like induration at the site of inoculation. Adrian published a similar experiment. In an effort to confirm these results Neisser in 1902 inoculated eighteen swine, but obtained only one skin lesion at all analogous to secondary syphilis, while its histological structure was not at all typical. The first experiment with an ape was made by Klebs in 1879. The inoculation was made with fragments of a chancre durum and was followed in six weeks by a papular eruption over the body. Martineau and Homonic in 1882 inoculated an ape and two indurated chancres developed followed in four weeks by enlargement of the lymphatic glands and ulcerations of the palate. Of forty-six apes, including several different species, Sperk in 1886-'8 was able to inoculate only a few successfully with syphilis. In one a chancre durum developed in twenty-one days, followed one month later by a papular eruption. A second ape, inoculated from the first, and a third ape, inoculated from the second, developed syphilitic-like ulcerations. Not all the experiments with the apes have resulted as favorably as those cited above. A great many experiments have failed. Mosse, Kreshaber, Fournier and Barthelemy were unable to inoculate apes successfully.

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* 1. Etudes expérimentales sur la syphilis. Metschnikoff et Roux, Annales de l'Institut Pasteur, 1309, XVII, 809. 2. Etudes expérimentales sur la syphilis. Metschnikoff et Roux, Annales de l'Institut Pasteur, 1904, XVIII, No. 1. 3. Anatomie pathologique des lésions syphilitiques observees chez les singes anthropoides. Arnal et Paul Salmon, Annals de l'Institut Pasteur, 1904, XVIII, No. 7. 4. Ueber eine Weiter-impfung von syphilitisch-infircten Chimpanzen. O. Lassar, Berliner klinische Wochenschrift, 1904, No. 52, 118. 5. Sur l'inoculation de la syphilis an singe. C. Nicolle, Annales de l'Institut Pasteur, 1903, XVII, 636. 6. Einige Syphilis-Uebertragungs-versuche auf Tiere. Neisser und Veiel, Deutsche medicinische Wochenschrift, 1904, No. 1. 7. Meine Versuche fur Uebertragung der Syphilis auf affen. A. Neisser, Deutsche medicinische Wochenschrift, 1904, Nos. 38 and 39, 1369.

Metschnikoff and Roux explain these divergent results as in part due to the fact that the investigators have not indicated precisely the species of ape used. In 1903 C. Nicolle published the results of some experimental inoculations, made with M. Nicolle in 1893, upon a species of ape known as the Macacus Sinicus. in three apes papulo-squamous lesions developed at the site of inoculation after an incubation period of fifteen to twenty days. In one ape enlargement of the lymphatic glands was present, in another alopecia. Homonic, in a recent communication to the Academy of Medicine in Paris, reports the successful inoculation of another species of ape known as the Macacus Cynomolgus. Metschnikoff and Roux also successfully inoculated an ape of the species Macacus Sinicus.

From these experiments it can be concluded that only certain species of the apes are immune to syphilis. The Macaci Sinicus and Cynomolgus are, however, susceptible to the virus but not markedly so. There is still another group of anthropoid apes known as Troglodytes which Huxley has shown by comparative anatomy to approach more closely the human organism. In this group are the chimpanzee, gorilla and orang-outang. Nuttal found in studying the hemolytic, agglutinative and precipitant substances of these animals that animal serum treated with human serum, showed the same properties against the blood and serum of these anthropdid apes as against human blood and serum. The chimpanzee, gorilla and orang-outang therefore were assumed by reason of their close relationship to the human organism, to be more susceptible to syphilis.

Metschnikoff and Roux used in their first experiment a female chimpanzee (*Troglodytes Niger et Calvus*). Inoculations were made at three points: (*a*) preputium clitoridis, with serum from a chancre durum of one month's duration; (*b*) right superciliary arch, from a newly developed mucous patch; (*c*) after five days had elapsed the left preputial fold was inoculated with material from a chancre durum of three days' duration. On the 26th day after inoculation a sharply circumscribed vesicle developed on the right preputial arch which gradually became indurated. Later lymphatic hyperplasia developed on the same side. The syphilitic nature of the lesions was verified at the Academy of Medicine by Fournier, du Castel and Hallopeau. Fifty-six days after inoculation papulo-squamous lesions developed on the dorsal and ventral surfaces and on the thigh and bore a close resemblance to human syphilides. There was also a general lymphatic enlargement. The animal died suddenly sixty-nine days after the appearance of the chancre. The autopsy showed general enlargement of the lymphatic glands and the spleen. The microscopic examination of the chancre showed an ulcer, secondarily infected. The specific nature of the lesion was not clear. Sections made from the secondaries showed them to be in process of healing. There was an increased formation of connective tissue, with a perivascular accumulation of mononuclear leucocytes. A second chimpanzee (male) was inoculated from the first at two points; (*a*) into the penis, with material from the chancre durum; and, (*b*) into the left thigh, with scrapings from papulo-squamous syphilide. After an incubation period of thirty-five days erosions developed on the penis and thigh, accompanied by hyperplasia of the lymphatic glands. The ulceration on the thigh developed into a typical chancre durum of the skin. The animal died of influenza on the seventieth day after inoculation. At autopsy no specific lesions of the internal organs were found. Sections from the lesion on the thigh showed the epidermis thinner than usual over the center of the lesion. The malpighian layer formed elongated projections into the deeper subepithelial tissue. The dermis was edematous and contained fibrin, small mononuclears and plasma cells arranged around the bloodvessels. An endophlebitis was present in one of the small superficial veins of the dermis with a proliferation of the endothelial cells obstructing the lumen. Numerous pigmentophages were also present in the inflammatory zone, containing pigment similar to that found in the skin. Histologically the lesion was characteristic of syphilis and all doubt was removed as to the specific character of the chancre in the case of the first chimpanzee. Scrapings of the chancre of the second chimpanzee were inoculated into an ape, Macacus Simicus, but no lesion resulted.

Lassar has reported the successful inoculation of two chimpanzees with syphilis. In the first animal a chancre developed and was followed by secondary lesions which clinically and histologically were specific. A second chimpanzee was inoculated from the first with the production of a chancre and typical secondary lesions.

From these experiments the following conclusions have been drawn by Metschnikoff Roux:

(1) The chimpanzee *(Troglodytes Niger et Calvus)* is more susceptible to the syphilitic virus than the apes (Species *Macacus*).

(2) A chancre durum of one month's duration is still capable of transmitting syphilis to a chimpanzee.

(3) In the case of the first chimpanzee, the second inoculation five days after the first, with actively virulent material, failed to

produce any lesion, therefore an immunity must have developed in five days.

(4) Syphilis is transmissible from one chimpanzee to another of the same species.

(5) The papulo-squamous syphilide is virulent.

(6) The failure to inoculate an ape with syphilitic material from a chimpanzee favors an attenuation of the virus.

In their second paper Metschnikoff and Roux report the inoculation of twelve apes of various species with successful results is only four. From one of these four (*Macacus Simicus*) material from one of the lesions was inoculated into a female chimpanzee (*Troglodytes Calvus*). Small scaly erosions developed after fifteen days which healed in ten days, attended with no induration. Thirty days after this inoculation had been made no secondaries developed, so material from a chancre durum (human) was inoculated into the same chimpanzee. After eight days the inguinal, cervical and axillary lymphatic glands were found to be enlarged. The chancre and no secondary lesions had developed after sixty-three days. It is possible then to attenuate syphilitic virus by passing it through apes—Species Macacus.

A series of experiments was carried out by Neisser and Veiel upon swine and apes, aimed to diminish the natural immunity to syphilis, thus making them succeptible to the virus. The basis of their experiments was the work done by Wassermann in diminishing the resistance of animals to infection. Natural immunity depends upon the bacteriocidal properties of the blood serum through its bacterio-lysins. The lysins are composed of two elements, the complement and the amboceptor, and neither one alone is capable of maintaining the immunity. Wassermann removed the complement by uniting it to a specific antibody, forming an anti-complement. Rabbits treated with serum from guinea pigs developed anti-bodies, which, when injected back into guinea pigs, formed anti-complements and so destroyed their immunity to the typhoid bacillus. Neisser and Veiel in their experiments used one swine and one ape from whose serum the complement had been removed by the injection of anti-bodies developed in the sheep and dog respectively. The inoculation of syphilitic material into these animals produced no lesion whatever.

The most recent experiments have been reported by Neisser and from his results of those of Metschnikoff and Roux, Lassar concludes that many of the earlier experiments reported as unsuccessful have now a greater significance. He also questions the propriety of using the term "typical" in describing specific primary lesions because it is well known that their appearance varies within wide limits.

Experimental inoculation of apes:

(1.) *Species Macacus Rhesus.*—Material inoculated cutaneously and subcutaneously failed to produce any specific lesions.

(2.) *Species Macacus Speciosus.*—Four animals inoculated. After an incubation period of thirty-nine days erythematous infiltrated swollen papules developed at the points of inoculation. A chimpanzee was inoculated with one of these papules, but the time of observation has been too short to draw any definite conclusions from this experiment. In a similar experiment (*vide supra)* Metschnikoff and Roux concluded that the virus was attenuated by passage through the ape and produced an immunity in a chimpanzee. Neisser questions the attenuation of the virus in his experiment and suggests the possibility that the appearance of the lesions may be modified by the species of animal used. As to the immunity said to have been produced in the chimpanzee, Neisser calls attention to the fact that only a small proportion of the inoculations into chimpanzees produce chancres.

(3.) *Species Hylobates.*—Inoculated with a chancre durum. After thirty-nine days indurative edema at the site of inoculation. Lymphatic hyperplasia on the fifth day. Papulo-squamous eczema on the one hundred and nineteenth day. Three months later hyperkeratotic papules developed on the extensor surface of the phalangeal joints. The long incubation period, the indurated lesions at the site of inoculation and the lymphatic hyperplasia argue for the syphilitic nature of the lesions.

EXPERIMENTS UPON CHIMPANZEES:

(1.) A young chimpanzee was inoculated at intervals with human blood serum from a patient in the secondary stage of syphilis, receiving in all 422 cubic centimetres. At the end of eight months no symptoms of syphilis were found. The same animal was then inoculated with material from a mucous patch, followed in thirteen days by erythema and infiltration at the point of inoculation and hyperplasia of the lymphatic gland. On the twenty-sixth day a sharply defined area, indurated and infiltrated, developed on the abdominal wall; in the forty-ninth day a general lymphatic hyperplasia, which healed in ten days, leaving pigmentation.

Conclusion.—(*a*) Human blood serum from a patient with active syphilis failed to produce syphilis when injected into a chimpanzee.

(*b*) The serum injection failed to produce a passive immunity, therefore Colles' Law depends upon an infection (mother is syphilitic).

The failure to produce infection by means of the blood serum supports the conclusion of Neisser made from similar experiments upon human beings.

The failure of the blood serum to protect may be due to too weak or too few anti-bodies.

It is possible that mercury may be a specific bactericidal substance for the parasite of syphilis and from the dead parasite immune substances may be set free. This is suggested by experiments of Ehrlich and Shiga upon the pigment therapy in trypanosome infection.

Cases treated with trypan red, after recovery retained an immunity lasting thirty days. This is attributed to immune bodies set free from the dead parasites.

(2.) A chimpanzee inoculated cutaneously and subcutaneously with material from a chancre durum developed lymphatic enlargement. A second inoculation was made on the forty-fourth day. No secondaries developed during a period of 119 days.

EXPERIMENTS UPON ORANG-OUTANGS:

Four animals were inoculated, three with syphilitic tissue and one with blood serum. In the first group one animal developed an induration at the site of inoculation and lymphatic hyperplasia. No secondary eruption. The diagnosis of probable syphilis was made. The fourth animal was inoculated with 128 cubic centimeters of blood serum, but failed to develop syphilis.

Should the orang-outang and the ape, species Hylobates, be proven susceptible to syphilis by later experiments it would be of great practical importance, since these varieties are most easily procured.

From these experiments it has been shown that the chimpanzee is susceptible to the syphilitic virus and a speedy solution of some of the problems so far unsolved can be expected. Among these Neisser has suggested the following:

(*a*) The development of the primary and general manifestations in the various methods of inoculation, *e. g.*, cutaneous, subcutaneous and intravenous.

(*b*) Do certain organs act as foci for the development of the parasites? and if so could not a differential diagnosis be made between the latent and healed syphilis?

(*c*) The investigation of the generative organs and their part in hereditary syphilis.

(*d*) Does the variation in virulence depend upon the quantity or quality of the virus? Do the secondary and tertiary lesions depend upon the mercury or upon the variation in virulence?

Gastric Ulcer in Childhood.—J. REICHELT (Wien. Med. Presse, Jan. 15, p. 126).—Ulceration of the gastric mucosa is rare in childhood and is usually due to scalds. Severe scalds produce extensive destruction of tissues and are rapidly fatal. Slighter degrees may be followed by cicatricial contraction. They are usually situated in the cardiac portion. Multiple ulcers not exceeding a lentil in size may also follow hemorrhagic erosions. Chronic simple gastric ulcer is very rare in childhood. Brinton saw 2 cases in 226 necropsies of gastric ulcers in children under

10, and Eröss 1 case in 17,745 consecutive necropsies in a poor-law infirmary. Recently Cutler reported three cases and collected 24 recorded cases ("REVIEW," p. 2). The writer reports the following case:—

A boy, aged 8, had always suffered from constipation with occasional attacks of vomiting. For a year he had had a burning pain in the gastric region, had refused food for fear of vomiting, and had become emaciated.

On June 13 there were signs of rickets and an anemic cardiac murmur. The abdomen was distended and the liver was slightly enlarged. The temperature was subnormal. There was a faint trace of albumin. There were frequent attacks of abdominal pain and obstinate constipation. On June 21 there was progressive anemia and an attack of tachycardia with pyrexia to 101°. On June 23 there were 2 attacks of diffuse abdominal pain, which had been preceded by the passage of 2 hard undigested motions after an enema. The temperature was 102.7° and the pulse 140. On June 24 he was restless, vomited a feculent mass, and was in great pain. At 3.30 a. m. on June 25 death occurred.

NECROPSY.—On opening the abdomen about a liter of brownish fluid of an acid odor and ocntaining white flakes escaped. There were no left kidney and suprarenal body, and the right kidney was hypertrophied. The intestines were covered with fibrinous flakes. One centimeter above the orifice of the pylorus on the lesser curvature was an oval sharply cut gastric perforation, which internally corresponded to a typical simple gastric ulcer. A second, larger oval ulcer, four-fifths of an inch in length and three-fifths of an inch in width, was situated on the posterior surface of the pyloric sphincter; its base was composed partly of fibrous tissue and partly of the head of the pancreas. There was no pyloric stenosis. The neighboring lymphatic glands were enlarged and hard. The gastric and intestinal mucosa was thickened and covered with mucus. In the large intestine were a quantity of scybala.

The cause of the ulcer was, in this, as in the majority of cases, acid dyspepsia, which had existed since infancy. In the reported cases of gastric ulceration in children death has not always been directly attributable to the ulcer. Thus in one case death resulted from scarlet fever and in 2 others from miliary tuberculosis. In a case published by Chvostek, a boy aged 18, after suffering from a gastric ulcer with pyloric stenosis for 14 years, died of inanition. Perforation and peritonitis are uncommon. A diagnosis was not made. There was no single typical symptom of gastric ulcer before the occurrence of perforation. The pain was frequently localized in one or other flank, and did not radiate to the chest, arms, or vertebral column, and was practically uninfluenced by food. Vomiting had persisted since birth and appeared to be independent of food. During the stay in hospital there was no vomiting until the onset of perforation the day before death. There had never been hematemesis or melena, though there was intense anemia.

In the *Jahrbuch f. Kinderheilkunde,* 60, Bd., 2 Hft., Bechtold publishes a somewhat similar case. A girl, aged 5, was seized with abdominal pain, and a week later had the signs of perforation and peritonitis. In spite of immediate laparotomy death occurred. There was a perforated gastric ulcer.

On the Diagnosis and Treatment of Hypertrophy of the Pylorus in Infants.—G. F. Still (Lancet, 1905, Vol. i., p. 632). The importance of early diagnosis in the so-called "congenital hypertrophy" or "hypertrophic stenosis" of the pylorus in infants has become increasingly evident in recent years, because what was formerly regarded as an incurable and inevitably fatal condition is, sometimes at least, amenable to treatment. In the writer's experience many, perhaps even a majority, of these cases recover completely if only they are recognized sufficiently early and subjected to suitable treatment.

The salient features of the disease are distinct. An infant under the age of four months, and over three or four weeks, persistently vomits its food two or three time in the twenty-four hours, and sometimes with such force and so suddenly that the food is shot out a foot or more from the mouth, and perhaps through the nostrils as well. Generally there is also obstinate constipation, visible and marked peristalsis of the stomach and a palpable thickening of the pylorus. The peristalsis and the pyloric thickening are essential symptoms for a correct diagnosis.

Sex. Although 17 out of 20 of Still's cases were males, it is unwise to lay too much stress on the sex in diagnosis of the disease.

Age.—As a general rule the vomiting does not appear until about the fourth or fifth week, but in one of Still's cases it began on the third or fourth day, and in three others in the first week. In twelve of his cases it began before the end of the fourth week, and in the eight others between the fourth and end of the seventh weeks. Onset as late as the ninth week has been recorded.

Vomiting.—The persistency, in spite of careful dieting, its forcibleness, the fact of the vomiting often coming on in carefully fed cases (breast in ten of twenty cases) and the large quantity of food brought up, representing more than one feed, are the chief characteristics of the vomiting.

Constipation.—Vomiting due to faulty feeding is generally associated with looseness and frequent action of the bowels, whereas that of pyloric stenosis is generally accompanied by obstinate constipation. There are, however, exceptions both ways.

Wasting.—This may suggest marasmus from faulty feeding, and so mislead.

The Two Characteristic Signs.—These may be overlooked unless examined for most carefully and for at least 10 or 15 minutes, as both depend on active contraction of the muscular wall of the stomach, and this organ may not contract when wanted to. The abdomen should be examined *immediately after a meal,* and the examiner's hands must be warm.

Visible peristalsis of the stomach is seen as a rounded lump, varying in size from that of half a large walnut to half a large Tangerine orange, rising at the left costal margin, and passing slowly downwards to the right hypochondrium. Before the lump has reached the middle line a second similar lump is already rising at the left costal margin. Sometimes three may be seen at once, moving slowly across the epigastrium and fading away at the pyloric region. The grossness of the wave, visible two or three yards away, is an important characteristic. The peristalsis may arise spontaneously, or it may require repeated stroking or kneading of the epigastrium to develope it.

Palpable Thickening of the Pylorus.—On deep palpation, usually just outside the right nipple line and about a third of the distance from the umbilical level to the costal margin, a hard, barrel-shaped lump, three-quarters of an inch long by half an inch wide, is to be felt *at intervals.* The contraction of the pylorus which gives rise to this lump may be excited by palpation.

Treatment.—Still holds that the hypertrophy is merely a secondary phenomenon, the result of excessive muscular action or spasm, and therefore his treatment is designed to allay the spasm and allow the pylorus to resume its natural condition. The medical measures which he adopts for this purpose are very careful watching and feeding and stomach washing. The medical man must be prepared to watch the case closely for weeks and months, using a weighing machine daily.

Diet.—Avoid all residue-leaving foods. Try whey alone, then add malt, barley water and gradually meat juice and white of egg. Bismuth may be given as medicine.

Stomach washing.—If strict feeding measures have no good result, the stomach must be washed out twice daily for several weeks just before a feed, and then once daily for some weeks longer, with a solution of sodium bicarbonate (two grains to the ounce of water) through a Jacques soft rubber catheter, No. 12 or 14. The frequency of the washings and the direction of treatment depend on the improvement which takes place. This may not be for some weeks, but so long as the infant does not lose ground, even if it makes no gain in weight, the washings should be continued. The food during this treatment consists of whey, with raw meat juice or a very weak peptonized milk mixture. Still had two cases which recovered completely under such treatment. The dangers and risks of washing out are dealt with fully in the paper.

Operative Treatment.—Forcible dilatation of the pylorus, pyloroplasty, and gastro-enterostomy are all adopted for the treatment of the disease. Seven out of nine of Still's cases treated by forcible dilatation recovered. However expert the surgeon may be, it is always a serious step to undertake any of these operations in such young infants, and before such be advised a fair trial of medical measures must be made.

Hypertrophy and Stenosis of the Pylorus in Infants.—F. L. Wachenheim (The American Journ. of the Med. Sci., 1905, p. 636).—The writer discusses fully the theories which hold that this condition is due (1) to spasm of the pylorus primarily and secondarily to hypertrophy, not of a high degree, and (2) to almost wholly anatomical causes—that it is a hyperplasia of the submucous connective tissue, and not merely a compensatory hypertrophy. He holds, however, that the affection may be due to both causes. "One condition consisting of an overgrowth of the muscular and submucous coats of the pylorus, narrowing the orifice of that viscus, and aggravated by a tonic contraction which is in all probability due to the abnormal innervation that usually accompanies muscular hypertrophy"; and "a second condition, a pyloric spasm pure and simple . . . associated with some slight secondary muscular hyperplasia." The prognosis of the former lesion is bad, of the latter fairly good. Clinically, there are two distinct affections, whose symptoms are almost precisely alike, but whose anatomy, course and prognosis differ very widely. He considers that the rarity of the disease has been exaggerated and that hundreds of cases have been overlooked within the last ten years. The diagnosis in many cases is not easy. The important symptoms are those referred to above in Still's paper. A table of 35 published cases that came to autopsy and another of 32 cases operated on are given. The mortality in the surgically treated cases operated on are given. The mortality recorded, and a description of the *post-mortem* findings, chiefly enormous hypertrophy of the muscular coats, in it is given. The paper would have been more interesting had the writer had before him Still's paper.

Etiology and Classification of Summer Diarrheas in Infancy.—C. H. Dunn (Archives of Pediatrics, June, 1905). The writer is of the opinion that the diarrheal disease of infancy occurring in the summer months differ in no way, either clinically or anatomically, from the diarrheal disease occurring in the cooler months, except in their much greater frequency. Classification on an anatomical basis, as, for example, into functional and organic, or non-inflammatory and ileo-colitis, is not convenient for etiological study, owing to the variety of lesions found in cases of similar etiology and similar clinical course, and to the lack of correspondence between the anatomical and clinical picture. The following clinical classification is suggested:—

(*a*) Acute nervous diarrhea, characterized by loose stools of normal color and odor, without abnormal constituents.

(*b*) Irritative diarrhea. Acute intestinal indigestion of the irritative type, characterized by the absence of persistent fever, and by the presence of curds and undigested masses in the discharges.

(*c*) Fermental diarrhea.—Acute intestinal indigestion of the fermental type, characterized by the absence of fever, and by green stools of a foul or sour odor.

(*d*) Infectious diarrhea, characterized by the existence and persistence of fever, and by the tendency toward early signs of ileo-colitis, as shown by the presence of blood, and excess of mucus in the discharges. When a specific organism, the bacillus dysenteriæ, is proved to be the cause, the case may be further particularized by the term infantile dysentery.

(*e*) Rare cases occur, corresponding to the known description of heat exhaustion, and cholera infantum.

Of the above differentiated types, the indigestion, including the irritative and fermental cases, is by far the commonest. The chief or primary cause of all the above types is the increased heat of the weather occurring during the summer months, which probably acts in the non-infectious cases by producing functional disturbance either of the nervous system or of the digestion; and which acts in the infectious cases by producing in the intestine conditions more favorable to the occurrence of infection. The name thermic diarrhea is suggested for the entire group. Bacteria are the secondary cause of a certain number of cases, such cases being mainly, if not wholly, of the type classified clinically as infectious. Infection occurs by the introduction of bacteria from without, or by auto-infection with bacteria already in the intestine. The latter is probably the usual method. The bacillus dysenteriæ is a cause of most of the infectious cases. Whether it is the sole cause remains to be determined. It can often be found in the intestine in cases where it probably has no causal relation with the pathological process. Such cases are usually clinically of the non-infectious type. Other organisms are probably a cause of some infectious cases. The anatomical changes of various kinds included under the term ileo-colitis may occur in any of the above clinical types, except the acute nervous. Anatomical changes of some kind probably occur in all infectious cases. The above attempt at clinical classification is suggested as a temporary one, and is advanced in the hope of making somewhat easier the work which will be done in the future on this subject.

Prevention and Treatment of the Status Epilepticus.—Konrad Alt (Münch. med. Woch., Mar. 28, p. 585).—In epileptics great attention should be paid to nutrition and digestion.

Coprostasis is frequently the cause of a succession of fits. Thus if the status epilepticus is threatened or established high intestinal irrigation should be immediately performed. Frequently an enormous quantity of scybala is washed out and the attack at once ceases. Other predisposing causes of the status epilepticus are alcoholism, the abuse of morphine, sexual excess, great heat, and especially insolation. Next in frequency to gastro-intestinal disorders as a cause of the status epilepticus is the sudden withdrawal of bromides after prolonged administration. The iodides, which are beneficial in syphilitic epilepsy or epilepsy depending on organic changes in the brain or meninges, may in functional cases occasionally increase the number of attacks and induce the status epilepticus. Pyrexia is another predisposing cause.

Death may occur in the status epilepticus through CO_2 poisoning (asphyxia), either from prolonged respiratory spasm or vomiting and lodgment of food in the respiratory tract. In the latter event septic pneumonia is a common sequela. Hemorrhage into the brain or other vital organs is also common.

TREATMENT.—A copious enema should be given. The room should be darkened and absolute quiet enjoined. The most useful drugs are bromides, chloral hydrate, amylene hydrate, dormiol, and opium which, as administration per os is usually impossible, should be given per rectum. Bromides are serviceable in the status epilepticus only when the patient is not habituated to their use, or when, after long administration, they have been abandoned abruptly. Repeated enemata of an 8 per cent. solution of bromide of sodium should be given. The result is more satisfactory and rapid if 30 gr. of chloral hydrate are added. If, nevertheless, recovery is delayed, a second rectal injection of a 2 per cent. solution of chloral hydrate (30 gr. in 100 c.c. of water) may be given 2 hours after the first, and occasionally even a third 2 hours after the second. A drachm of chloral hydrate usually suffices to arrest the convulsions, provided that it is retained, and unless the pulse is strong should not be exceeded. If the cardiac action is weak from the first, or becomes weak after the administration of chloral, amylene hydrate is preferable. It is but slightly less powerful than chloral hydrate, and is absolutely innocuous. The writer originally administered it hypodermically or intra-muscularly in a 1 in 3 aqueous solution, giving 2 to 5 ordinary Pravaz syringefuls, but now prefers the rectal method. Forty-six to 92 gr. should be given dissolved in 100 c.c. of water, and the injection be repeated 1 to 2 hours later, even if there has been no return of convulsions. The action in enemata is slower but more prolonged than when given hypodermically. This avoids the pain of the intramuscular injections, which appears occasionally to be the starting point of fresh fits. Intramuscular injections of amylene hydrate are indicated only in unusually alarming cases, or if rectal injections are not retained. In the latter event a small starch and opium enema (15 to 30 min. of tr. opii) may enable the amylene hydrate to be retained, or may be given alone. In children especially, 10 to 15 drops of tr. opii in enema are usually successful in arresting the fits. Dormiol has the same action, and may be given in the same doses as amylene hydrate. In all cases in which the heart is weak the addition of 10 to 15 drops of tr. strophanthi to the sedative enema is advisable.

In the large majority of cases the status epilepticus may be arrested by these means, and after a prolonged sleep recovery occurs. But in a minority no effect whatever is produced. The last resource is chloroform anesthesia. Deep anesthesia is not necessary to arrest the convulsions, though they return when the administration is suspended. The writer gives a small quantity of chloroform for one-half to one hour, and during the administration gives an enema of amylene hydrate. The latter begins to act when the chloroform is suspended, and often prevents a return of convulsions. A second rectal injection should follow shortly. Occasionally it is necessary to administer chloroform a second or even a third time, or even uninterruptedly for a prolonged period. Even if the heart is weak chloroform is without danger in epilepsy if combined with inhalations of oxygen. About 50 liters of pure oxygen are first respired in the chloroform-oxygen mask; then a minute quantity of chloroform in tiny drops is allowed to evaporate in the stream of oxygen. Finally the sleeping patient, to whom, while anesthetized rectal irrigations and amylene hydrate have been administered, is allowed for a time to respire pure oxygen.

In cases in which there is high pyrexia from the first or in which there is general muscular restlessness during the comatose stage, prolonged cold baths or cold douches are sometimes beneficial. In sthenic, full-blooded epileptics, if there is acetonuria, venesection, with or without subsequent injection of normal saline solution, occsaionally succeeds. The writer frequently gives enemata of normal saline solution without venesection, with a view to dilute and purify the blood. If the status epilepticus is prolonged for days and there is inanition, rectal feeding with milk, eggs, starch, sanatogen, and sodium chloride are indicated.

The treatment recommended is also useful in puerperal eclampsia, the convulsions of general paralysis, and, with correspondingly small doses, in the convulsions of infants. A succession of fits in general paralysis may be practically indistinguishable from the status epilepticus. A useful distinction is that acetonuria is almost constantly present at the beginning of the status in general paralysis, but very rarely in uncomplicated epilepsy.

Appendicitis in a Child discovered by Rectal Examination. Dan McKenzie, M.D. (Brit. Jour. of Children's Diseases, Jan.,

p. 542).—Dr. George Carpenter has pointed out the importance of rectal bimanual examination in the diagnosis of abdominal diseases in childhood (*Pediatrics,* June, 1896). His list includes constipation occasioned by a sacral tumor; an umbilical fistula secondary to a prostatic abscess; a horse-shoe kidney simulating tuberculous peritonitis; tuberculous peritonitis and its distinction from chronic gastro-intestinal catarrh with abdominal enlargement; abdominal abscesses secondary to appendicitis and other causes; tuberculosis of the ureters; impaction of calculi in the ureters; vesical calculus; hydronephrosis and pyo-nephrosis; tuberculosis of the uterus and adnexa; ovarian tumors; hydatids and congenital mesenteric cysts. The following case was observed by the writer.

A boy, aged 4, was suffering from malaise and had a temperature of 101°. As he was subject to periodic attacks of acute gastric disorder resulting from dietetic indulgence, nothing unusual was expected, and although he was examined in the ordinary manner, nothing was found. Next day, with a temperature of 103°, he was complaining of stomach-ache and pain on micturition. Examination of the abdomen was unsatisfactory, as the child was refractory, but as far as could be made out the abdomen was hard and seemed to be tender. Per rectum the bladder was felt to be full and fluctuating. Expecting to find some cystic trouble he was anesthetised and a catheter was passed without discovering anything. But on rectal bimanual examination an oval tumor of the size of a pigeon's egg was found towards the right side of the pelvis. Appendicitis was diagnosed. On the same evening the appendix was removed. It showed several perforations and was lying in a bath of pus.

The pelvis in a child is much shallower than in an adult, so that the abdomen can be more completely examined per rectum.

Epidemic Cerebro-spinal Meningitis.—The prevalence of epidemic cerebro-spinal meningitis on the continent of Europe and in the United States has naturally led to the appearance of a great many papers on the subject and some abstracts of recent articles may not be without interest. The disease appeared in New York in February 1904. Its first intensity diminished with the advent of summer, but in winter a recrudescence occurred, and from 1st January to 15th April of this year there were 910 deaths. The disease has also appeared in Boston, in Ohio, and in Pennsylvania. In Silesia, from December 1904 to March 1905, there were 1088 cases, with 582 deaths. In the American epidemic, Councilman has shown that when the cerebro-spinal fluid contains other organisms (*e. g.,* the pneumo- or streptococcus) in addition to the meningococcus, the disease is almost always fatal. All the American observers agree on the great diagnostic value of Kernig's sign. A new method of treatment—the injection of antidiphtheritic serum—is under trial, the idea being that there is an antagonism between the Klebs-Löffler bacillus and Weichselbaum's diplococcus meningitis.—*Jarvis, Presse méd., Paris, 1905, May 6.*

Kirchner *(Berl. klin. Wchnschr.,* 1905, June 5 and 12), dealing with the best means of combating the epidemic, states that in one Silesian province within three months the death-rate has been seven times as great as during the whole triennial period preceding. The epidemic is believed to have originated in Galicia, and the Silesian provinces infected are industrial localities,—by far the most densely populated area of the German Empire. The infected zone lies east of the river Oder; the river limits intercourse between dwellers on the opposite banks, and the fact that the disease has not crossed it shows the importance of direct contact as a means of transmission. The whole circumstances and distribution of the outbreak can be explained only on the supposition that the disease spreads solely by personal communication. As to the age distribution, nearly one-half of over 2000 consecutive cases occurred in children under six, and another third between the sixth and tenth years. Statistics show, however, that contagiousness is comparatively slight, and the question has been raised as to whether there may not be some intermediate channel of infection (the flea has been suggested in America) analogous to the part played by rats in the transmission of plague. Epidemics begin gradually with a few isolated cases, and sudden generalized outbursts are unknown. In family epidemics the rule is to find that several cases occur simultaneously, so that the question of infection from one to another does not arise; the infrequency of serial cases in one house is against there being any intermediate host. It is often noticed that the return of a laborer from an infected district to his home at a distance is followed in three or four hours by a case of meningitis there. The present epidemic has allowed of the investigation on a large scale of the relationship of the micrococcus meningitisis of Weichselbaum to the disease. It has been found in the cerebro-spinal fluid of 138 out of 243 patients, post-mortem in 68 out of 139 bodies, while the blood gives a positive agglutination in 55 per cent. of cases. The nasal secretion of 635 patients contained the organism of 23 per cent., while it was found in only 9 per cent. of healthy persons. One reason why it cannot always be detected in the cerebro-spinal fluid is its extreme vulnerability; the majority of positive results are got in the first few days of the illness. It is extremely sensitive to the action of disinfectants, being rapidly destroyed by 1 to 800 carbolic acid. In addition to the general application of sanitary restrictions, Kirchner believes that much can be done to save life by energetic treatment. Hot baths he especially recommends, and cautiously repeated lumbar puncture, withdrawing only a few cubic centimeters at a time. Risk of contagion is lessened by disinfecting the throats and nostrils of the parents.

Westenhoeffer (*Berl. klin. Wchnschr.*, 1905, June 12) treats of the *pathological anatomy and mode of infection,* on the basis of investigations made on twenty-nine bodies of patients dying during the present epidemic. His observations had as their object to determine—(1) the point of entrance of the germ, (2) the channel by which it reaches the meninges, (3) the lesion it produces. He invariably found lesions of the naso-pharynx, which, with the middle ear, antrum, and sphenoidal sinuses, was filled with muco-pus. The pharyngeal tonsil and mucous membrane generally were swollen and inflamed, but the anterior part of the nose was not affected. These changes were most marked in quite recent cases. The earliest signs of meningitis develop near the sella turcica, the infection probably entering along the vessels which pass into it from the post-nasal space. Developmentally the hypophysis is a sense organ which communicates directly during fetal life with the naso-pharynx; thus extension of the infection to the sella turcica is analogous to its spread to the other accessory sinuses of the nose—the antra, sphenoidal air cells, etc. The author emphatically contradicts the statement that infection spreads from the ethmoidal cells. These he always found healthy, the reason being that they communicate with the anterior nares, which, as stated above, are spared. The constancy with which squinting is a first symptom points clinically to the early implication of the sella. The Sylvian fissures are little affected, and the spread of the meningitis proceeds by the lymphatics, not by the vessels. Another fresh observation is that most children dying of the disease show evidences of "lymphatism"—enlargement of the pharyngeal tonsil, thymus, and lymphatic structures generally. Westenhoeffer speaks somewhat guardedly as to the cause of the disease. The meningococcus of Weichselbaum was found in most of his cases, but he does not regard the relationship as proved. Either other cocci must be capable of producing exactly similar results, or the cause is as yet unknown, and the organisms which have been found are secondary, like the streptococci of scarlet fever. The individual proclivity to the disease is undoubtedly most variable; the children who are most likely to be infected are those who suffer from enlarged tonsils and adenoids. On account of the dry, dusty, sulphureous atmosphere of the infected region, nasal and pharyngeal catarrh is common, and this may perhaps have some connection with the prevailing malady.

Symptomatology.—Foster contributes a study of thirty cases in the New York epidemic (*Am. Jour. Med. Sc.*, Phila., 1905, June), in which he draws attention to the spread of the disease among families as proving its contagiousness. The epidemic occurred during the early part of 1904, and coincided in point of time with an outbreak of extremely severe pneumonia. No disease shows greater lack of regularity in its mode of onset than cerebro-spinal meningitis. In most cases there is no period of incubation during which malaise is present; the invasion is extremely sudden in many of those attacked; splitting headache, delirium, and convulsions are commonly the first symptoms, and in children vomiting and gastro-intestinal disorder, with less violent headache. Pain may be limited to the head, or extend to the trunk and limbs. Head retraction, opisthotonos, and spinal hyperesthesia are almost constant; sometimes there is nothing except slight head retraction, which inconveniences the patient scarcely at all, and is only recognizable as an evidence of the disease after lumbar puncture has been performed. It is impossible to found any classification of the cases on the type of the fever. The very worst cases may run an almost afebrile course; the most favorable generally range between 101° and 104°. A normal temperature unaccompanied by amelioration of the symptoms generally foreshadows a protracted illness. As in typhoid, the pulse is relatively slow. Rashes were comparatively infrequent in Foster's cases—purpura in six, herpes in five, and pustules in one. The blood was systematically examined, and, except for a polynuclear leucocytosis (average 18,000 in adults, 20,000 in children) no important changes were found. A Gram-negative diplococcus, identical with the meningococcus, and pathogenic to white mice, was isolated from the cerebro-spinal fluid of all cases; no prognostic data, however, were obtained by lumbar puncture. As to special nervous symptoms, the eye is the organ most commonly involved, strabismus, nystagmus, exophthalmos, and visual defects having been noticed. Optic neuritis occurred twice only. The reflexes may be exaggerated at first; later they are almost always abolished. Kernig's sign is common in adults, less so in children. Heart complications occurred in five cases; pericarditis seems particularly liable to escape detection during life, notwithstanding careful examination of the chest. In the cardiac lesions the meningococcus of Weichselbaum was present. Lobar pneumonia was twice, and arthritis thrice, met with. The infection often invaded the eye, producing destructive changes on the globe. In adults the diagnosis was easy; in children the disease may be simulated by gastro-enteritis and broncho-pneumonia; lumbar puncture, however, furnishes a crucial test. Foster's mortality was 60 per cent. In addition to the usual symptomatic remedies, he recommends lumbar puncture, repeated at intervals of three or four days; it relieves headache and delirium, and brings the semi-comatose patient back to consciousness. He is not enthusiastic on the value of intraspinal antiseptic injections, but tentatively encourages laminectomy and drainage. The clinical manifestations of the disease are also treated of by Haber (*Med. News,* Phila., 1905, May 27), who divides cases into malignant, ordinary, and anomalous forms. Fulminant cases show profound toxemia; there is generally a profuse purpuric rash and hyperpyrexia, and death takes place within forty-eight hours. Relapses are common in abortive cases. Intermission of symptoms is often seen. When the course is chronic, extending over a month or more, either abscess or hydrocephalus is likely to occur. General convulsions occur at the outset; later we have squinting, mono-or hemiplegia, rhythmical tremor, affection of sphincters, and local convulsions. Head retraction and Kernig's sign are very frequent. The temperature, pulse, and respiration are so variable as to be of no diagnostic or prognostic aid. In addition to the ordinary symptomatic remedies, the author advises baths at a temperature of 104°, an ice-bag being applied to the head at the same time. These should be repeated several times daily.

Bacteriology.—In a recent paper, Pinto (*Journ. de physiol. et de path. gen.,* Paris, 1904, November 14) insists on the *similarity between the meningococcus and the gonococcus.* Morphologically they are identical, even to the point of being found within the bodies of cells; tinctorially they are the same, the conditions under which they can be cultivated are similar, though the vitality of the gonococcus in the urethra contrasts with the short duration of life of the meningococcus in the nervous system. Toxins with almost identical properties have been isolated from both organisms. Attempts to inoculate pure cultures of the meningococcus into the urethra have, however, failed. Weichselbaum (*Wien. klin. Wochenschr.*, 1905, November 24) regards the presence of the *micrococcus meningitidis in the nasal secretion* as proved, and therefore looks on contagion as occurring directly by the air. The conflicting views of epidemiologists and clinicians on this point are due to the feebleness of the virus, which can only be communicated, and, when communicated, spread to the meninges, under favorable circumstances. Disinfection of the nose and throat, however, is clearly an important prophylactic.

The chief point in a paper by Grawitz (*Berl. klin. Wchnschr.*, 1905, June 17) is that the reasons for cerebro-spinal meningitis assuming an epidemic form are entirely obscure. None of the suggested explanations are adequate, and the only fact definitely known about the contagiousness of the malady is that, so far as sporadic cases are concerned, it is extremely slight. In time of epidemics, he emphasizes the great importance of prompt diagnosis of the first cases in a locality; and as it is often clinically impossible to distinguish between this and the tuberculous form of meningitis, lumbar puncture should always be practised. Even if the bacteriological test be negative, the cells of the fluid are polymorphonuclear in the cerebro-spinal form of the disease, lymphocytes in the tuberculous type. Among other papers, which it is impossible to do more than mention, are those of Heine on the "Eye Lesions in Cerebro-spinal Meningitis" (*Berl. klin. Wchschr.*, 1905, June 19), which contain copious references to the literature; Bailey on "Cryoscopy of the Cerebro-spinal Fluid" (*Med. Rec.*, N. Y., 1905, February 11), which, so far, has been of no practical use; and Seibert (*Med. Rec.*, N. Y., 1905, June 17 advocating *rectal injections of sodium salicylate* as a useful therapeutic agent.

The Treatment of Whooping Cough.—Stepp (Therap. Monatsh., 1904, November) claims that in fluoroform we have a drug of the utmost value in the treatment of whooping-cough. Fluoroform is a drug of the chlorine, iodine bromine series, but is much more powerful in its action than any of the others. The solution generally employed contains 2 to 2½ per cent. fluoroform dissolved in water, and the dose is a teaspoonful every hour for babies, while older children may have up to a tablespoonful. Stepp illustrates the result of his treatment by a series of graphic curves, by means of which the number of paroxysms are shown from the commencement of treatment until the whoop has disappeared. He has treated twenty-one cases by this method, eleven of the patients being under a year old, and the remainder all under four years, and he has not lost a single case. The paroxysms diminished in force and number from the day of commencing treatment, and the duration of the characteristic cough was reduced to from six to eighteen days. The illustrative curves demonstrate a very rapid fall at the beginning of treatment, then more gradual, and once again a much more rapid decline, and this fall of the curve is so regular in its course as to suggest some specific action of the drug. The author records at length many cases showing the result of his treatment. Thus, in one baby the number of attacks fell in three days from twenty-three to fifteen daily; in another infant of four weeks the attacks diminished from fifty-five to nineteen; and in still another from twenty-seven to three. Results such as these speak volumes for the efficacy of this drug, for even discounting the optimism of the writer in favor of his new remedy, any treatment that can show twenty-two consecutive recoveries in severe cases of whooping, mostly occurring in infants under a year, is certainly deserving of a very extended trial. The drug is tasteless, odorless, and apparently harmless, its only disadvantage being that it is somewhat expensive. Sometimes it occasions some slight pharyngeal irritation on being swallowed.

The Teaching of Pediatrics.—In his chairman's address befor the Section on Children's Diseases at the recent session of the American Medical Association, J. Lovett Morse, (*Journal A. M. A.*, August 19, 1905), describes the method of teaching pediatrics at Harvard University Medical School. The subject comes up in the non-elective studies of the third year, and in the elective studies of the fourth year, students intending to engage in general practice are advised to take at least one course of 125 hours in this department. During the third year the instruction is given to the whole class by 30 lectures, 24 clinical lectures, 10 recitations and 10 exercises in case teaching. The department of pediatrics consists of one professor, one assistant professor of contagious diseases, an instructor, a clinical instructor and two assistants. The department practically controls the medical wards of the Children's and Infant's hospitals, as the nomination of the visiting physicians to these hospitals is in the hands of Harvard University. In the elective fourth year, the student can take more than one course in a specialty if he wishes, but can not give his whole time to one subject without the permission of the head of that department. The department of pediatrics offers a course of 125 hours each month, and those who take several of these or devote their whole time to the subject have a chance to follow up special lines of work and to carry out original researches. Dr. Morse insists on the importance of having pediatrics a special department by itself, not subordinate to any other department. He thinks, however, that the subjects of the anatomy, development, physiology and pathology of infancy and childhood should be taught in the regular courses on these subjects if practicable. He also insists that the teaching can never be ideal until the instructors, or at least the heads of departments, are able to devote their entire time and energy to the instruction.

Our Duty to the Child from a Dental Standpoint.—A. M. Stevens (Journal A. M. A., Aug. 19), discusses the general lack of appreciation of the real value of the proper condition and development of the organs of mastication in children. The physician especially should be the one to call early attention to defects and deformities of the teeth and jaws, and to insist on the proper care of the milk teeth. The importance of attention to the condition of the mouth in the treatment of diseases like gastritis and in surgical operations, such as the removal of adenoids, is noted, and she thinks that physicians sometimes need a little more than a gentle reminder of this fact, for medical literature is singularly scanty in reference to the subjects of the neglect of dental cleanliness and the deformities caused by too early extraction of the deciduous teeth.

Summer Diarrhea.—M. OSTHEIMER (Journal A. M. A., Aug. 26, 1905), discusses the methods of prevention of infantile summer diarrhea. The most important thing, he states, is to educate parents to keep children properly bathed, to keep them cool, to remove soiled napkins, to see that the children obtain sufficient sleep, to protect them from infection by flies and to properly regulate their diet. Frequency of feeding, cleansing of bottles, etc., must all be taught. With the appearance of any gastrointestinal disturbance, the milk should be stopped and barley water or whey given. This education of the parents is best accomplished by the judicious distribution of pamphlets, instructing mothers in the care of infants during the heated term. In the fifteen largest cities of the country such distribution is provided for only in nine, and details are given as to the extent of this useful practice. It would be advisable, Ostheimer thinks, to have special "milk" courses given in the public schools, and the high schools, especially, and in the medical schools and hospitals. The fact that clean milk can be procured will then be recognized. It would be well also if large cities would run a dairy under the supervision of the health department. If this is impracticable, such a dairy could be established by private subscription. Ostheimer gives a sample of instructions to be issued by health departments, based on the pamphlets already mentioned, to be given out by district physicians and medical inspectors, and also to be distributed from dispensaries, milk depots, etc. Some should also be given to physicians in general practice for the benefit of patients, the well-to-do as well as the poor.

Summer Diarrhea.—J. C. Cook (Journal A. M. A., August 26), reports the results of bacteriologic and blood examinations in fifteen infants suffering from summer diarrhea during the months of July and August, 1904. In eleven non-fatal cases, averaging nine and one-third months, in which the children had been carelessly fed by poorly nourished and ignorant mothers, the most striking bacteriologic findings were the frequency of the pneumococcus, this micro-organism being found in seven cases each of examinations of the stools and the throat. The colon bacillus was found in the stools in seven and in the throat in six cases. The bowel movements were not excessively frequent, averaging four daily in these milder cases. In one of the fatal cases, well-marked bronchopneumonia existed and the pneumococcus was present in every organ examined, as well as in the blood and stools. The same complication was present in another of the four fatal cases and the pneumococcus was found in the stools as well as in the lungs. In another fatal case there was found a red pigmenting bacillus of the colon group staining the stools blood red and causing the attending nurse to report hemorrhage, though microscopic examination revealed no evidence of it. Cook remarks that in some cases of infantile diarrhea a septic condition is probably set up by the entrance into the system, through the bowel lesions, of well-known pathogenic germs like the pneumomococcus, and that this specific intoxication may be masked by the symptom of the milder infection.

PEDIATRICS

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ORIGINAL ARTICLES

THE OTHER SIDE OF INFANT FEEDING.*

By Dr. D. E. English.

Volumes have been written in the last ten years on the question of how so to modify cow's milk as to make it a suitable food for infants. Everything has been recommended in turn from simple dilution with water, to the making of a complex mixture about as much like milk as it is like sea-water or turtle soup. Elaborate tables have been constructed, and mathematical calculations required that, if rigidly followed out, would limit a doctor's practice to about two patients a day, and yet the perfect food for the infant who cannot get breast-milk has not yet been found. It seems probable to me that when it is found it will differ widely from mixtures of cow's milk with other things in an effort to make an artificial imitation of mother's milk. What its nature will be I do not pretend to know, and it is not this side of the question that I wish to discuss now. There is another side that seems to me to have been largely neglected in our frantic endeavors to make an artificial mother's milk; that other side of the question being not the food, but the baby.

No food will agree with the baby unless it is properly administered. Lectures and writers on pediatrics have long been teaching us that the baby's food should be administered in certain fixed amounts, and at certain exact intervals of time, according to the age of the patient.

This I believe to be a mistake. As near as I can determine by long observation, none of the young of the lower mammalian animals suckle at exactly regular intervals, or take any regular and exact quantity of nourishment at a dose. On the contrary their mothers do not allow them to suckle until they have complained and teased for some little time, and then, when at last she does allow them to feed, they continue doing so until their stomachs are distended and the abdomen is rounded and tense. I am unable to see any reason why this mode of feeding should not be as well adapted to human babies as to the young of other mammalians. It certainly has proved to be so in my practice.

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* Read before the Summit (N. J.) Medical Society at its regular meeting on June 30, 1905.

In consequence I have laid down two primary rules for feeding infants, whether breast fed, or bottle fed, among my own families, as follows:

I. Never feed a baby until you are sure it is hungry and its stomach empty. Try to satisfy its craving for a time with water. Let it cry and worry a while before each feeding. Not long enough, of course, to get it too nervous, or hysterical, but long enough to arouse in its stomach a strong craving for, expectation of, and preparation for, the ingestion of food.

II. Whatever you may feed the baby be sure the baby likes it, so that it will continue feeding until the stomach is full and distended. Do not allow the patient to fall asleep too soon, but wake him and make him go on feeding until he is full and "runs over." This seems to me to be the natural and most rational way of feeding an infant. Under the plan of feeding a fixed amount at exact and equal intervals, I believe the baby is often fed when there is undigested food remaining in the stomach from the last meal. This remainder is perhaps already fermenting, is in fact, a rich culture of the germs of fermentation all ready to mix with the fresh food that is put in too soon. Moreover in this method of feeding the baby sometimes gets too much food, sometimes too little food. A baby cannot always digest the same amount of the same kind of food in the same number of minutes, any more than an adult can. The result is that there is nearly always some food in the stomach, and never enough food in the stomach at one time. This will inevitably cause dilatation of the stomach.

In one way of looking at the stomach it is a muscle. Now no muscle will grow and develop unless it is properly used. If this stomach muscle is not properly exercised it will remain small, weak, toneless. The way to exercise and develop the infant stomach is to distend it with food, and then to allow ample time for digestion, evacuation, contraction and rest before introducing more food.

Dilatation is due to too frequent feeding, not to giving too much food at one time. Under this natural method of feeding it will be found that the baby will thrive on a simple mixture, which would not agree with it at all when given in regular amounts at regular intervals. The only difficult thing about it is to get the mother or the nurse, to allow, or compel, the baby to cry and worry long enough before feeding. They are entirely too tender-hearted for the good of the baby. A dog or cat will let its young cry in the most pitiful way for a long time before allowing them to feed, but to the human mother every second that her "precious darling" cries is an eternity of torture.

Nor is the method of feeding the only thing that has to do with the digestion or non-digestion of the food. The baby will not absorb and use much food unless there is a call for it. If a baby is over-clothed and over-coddled it cannot digest enough food, simply because it is not allowed to use it. Too much clothing is a common error. It causes sweating and makes the skin weak and tender, easily chilled, and entirely unable to respond to the natural stimulus of slight changes of temperature. It is a rule with few exceptions that a baby never "catches cold" except from too much clothing. A baby's clothing should never cause perspiration. Too much clothing also prevents natural exercise, it does not allow of freedom of movement. A baby, if untrammeled, will exercise its muscles almost contnuously when awake. This favors metabolism and growth, creates an appetite, and strengthens the digestive powers. If a baby is never called upon to resist anything it will never have strong powers of resistance. It should be carefully accustomed to sudden changes of temperature, and to cool baths. This will of itself create a call for food that will make both the method of feeding and matter fed, much simpler problems. An infant should spend several hours of each day without clothing, lying on a moderately smooth and firm surface. Under such circumstances it will exercise its muscles so that they will properly develop, and thus produce a natural call for food. It should take its daily nap or naps in the open air, and spend the night in a cool, well-ventilated room, thus insuring the necessary supply of oxygen for metabolic purposes. It should drink a proper amount of water, which means all it can be induced to take before each feeding, so that the growing tissues will receive the needed quantity of that indispensable ingredient.

If fed on other food than breast-milk, its food should be well salted. This not only supplies a needed article of growth, but creates a thirst for water, and tends to prevent the fermentation of food in the stomach.

To recapitulate.—Never feed a baby until it is undoubtedly hungry and its stomach entirely empty. Then feed it until the stomach is full and distended. Clothing should never cause sweating, nor be too confining. Let the baby be unclothed several hours a day. Accustom it to changes of temperature and cool baths. Allow it an unlimited supply of pure air. Persuade it to take a great deal of water. Have its food well-salted.

ON THE OCCURRENCE RECENTLY IN EDINBURGH AND NEIGHBORHOOD OF UNUSUAL FORMS OF CEREBRO-SPINAL FEVER AND INTOXICATION, RESEMBLING EPIDEMIC CEREBRO-SPINAL MENINGITIS

By Alex. James, M.D., of Edinburgh

Within the past fifteen years I have seen, from time to time, as I daresay a good many others have, serious and often fatal cases of cerebro-spinal intoxication and fever, in which the ordinary causes of such symptoms could be apparently excluded, and for the explanation of which, therefore, some less ordinary infective or toxic agency had to be thought of.

Within the past few months it has been my experience to see, in the Infirmary and elsewhere, of such cases a much larger proportion than usual.

My object in bringing this subject before you at present is to discuss: first, if a similar prevalence of this class of case has presented itself in the experience of others; and secondly, if any precise conclusions as regards its nature can be arrived at. In what I have to say I shall concern myself specially with the clinical aspects; and I shall not detail to you all the cases I have seen, but confine myself to sketching out a number of the more marked and outstanding ones. Most of them, as I have already stated, have occurred within the past few months, and to these I shall devote most attention. Inasmuch, however, as the clinical picture which I wish to portray might lose somewhat if some of the older ones were not included, I shall in the first place sketch out some of them.

One day in May 1890 a number of boys belonging to the Edinburgh Industrial Brigade Home were having a holiday in the country. Whilst they were all at play, one of them, a healthy-looking boy of 13 years, was discovered lying on the ground at the foot of a tree in a state of unconsciousness from which he could not be roused. He was conveyed home, and in the late afternoon I saw him. He was rather pale, and his pupils were dilated; pulse 80 per minute and rather feeble; his temperature was normal.

There were no indications of hemiplegia or other forms of paralysis, and he was completely unconscious.

From his companions, all I could ascertain was that he had complained of some headache in the early part of the day, and that it was most unlikely that he had fallen from the tree or had sustained any hurt. About 11 P. M. twitchings of the muscles of the face with some retraction of the head were noticed, and these continued at intervals till 1 A. M., when he died.

As causes, injury, hemorrhage, cerebral tumor or abscess, sunstroke, poisoning, were all thought of, but at the sectio, with the possible exception of some hyperemia of the grey matter of the pons and medulla, all the organs were found quite healthy.

Of similar cases I could report several others, but I shall now pass on to cases occurring in 1903.

Agnes B., aged 13 years, was sent to me by Dr. Melville of Penicuik on the 5th of March, 1903. She was a particularly well-nourished and healthy-looking girl, and her only complaint was absolute nervous deafness. Her mother gave the following history:

Her illness had commenced in the second week of the previous December, and the main symptoms were fever and headache. The headache seems to have been specially severe in the back of the neck, and there was great tenderness, the child crying out whenever attempt was made to move her in bed. There was no retraction of the neck, but some stiffness of the muscles. Vomiting was also a prominent symptom, and was stated to have been incessant for two days and two nights. After a few days the child seems to have become comatose, and to have remained so for some days. After about ten days recovery occurred, and it was then noticed that her hearing was impaired, the child asking why everyone was whispering. In a few days the child became completely deaf. About six weeks after the commencement of her illness, the child was allowed out of bed, and giddiness and incapacity to stand or walk were noticed. These last symptoms, however, have now disappeared, and, except for the nerve deafness, the child is absolutely well.

James C., aged 7 years, was sent to me by Dr. Dow, of Crail, on 7th March 1903. His complaint was complete blindness, of nine days' duration. His history was as follows:—

He had been a perfectly healthy boy in every respect until nine days previously. He had then become suddenly very ill, with high fever (104°), severe headache, sickness, and vomiting. Those acute symptoms lasted for three days, and then it was noticed that the right pupil was widely dilated, and that he was blind of the right eye. In the course of a day or two a similar condition was observed in the left eye. The acute symptoms having passed off, but the blindness persisting, Dr. Dow sent him to me to the Royal Infirmary. On admission he was found to be a perfectly healthy, well-developed, and well-nourished boy. He was blind, and had to be led about. His pulse was 72 per minute, temp. 98.8°, coming down next day to normal, and remaining so. For a day or two, however, after admission, he complained of occasional rather severe frontal headaches.

On examination, all his organs and systems were found to be healthy, except his nervous, and of that only the eyes were affected; sensory, motor, and reflex phenomena, and the special senses—hearing, taste, and smell—being absolutely unimpaired. He was so blind that he could not see objects held in front of him; but he seemed to prefer being in darkness, a bright light tending to irritate his eyes. The pupils were widely dilated, especially the right, and they showed no reaction to light. On testing the movements of the eyes, it was found that conjugate movement to the right was slightly impaired; more so with the right eye. With the ophthalmoscope, no definuite changes in the fundi could at this time be recognized. A small quantity of the nasal secretion was examined. The diplococcus intracellularis meningitidis was not found.

March 21.—Patient's general condition remains excellent, and his headaches are less frequent and severe. Blindness persists, and distinct signs of optic atrophy are present in both eyes.

March 26.—Patient's vision has been improving for the last few days. He does not focus on looking at objects, but he was able to-day to distinguish a knife from a pencil. The signs of optic atrophy are more distinct.

May 17.—Although he has had an occasional headache, patient's general condition remains excellent. His vision has so much improved that he can go about the ward himself, and can count fingers in a good light, eight or ten feet off. The left eye is the better of the two. Both pupils are still distinctly dilated, but both contract slightly with light, the left eye showing this the better. The impaired conjugate movement of both eyes to the right has greatly disappeared. With the ophthalmoscope there is well-marked white atrophy in both eyes. Anent these two cases the explanation which commends itself to me was, as stated at the time, that "be it epidemic cerebro-spinal meningitis or not, the lesion is one of a toxin involving the nuclei of origin of the auditory and optic nerves. Just as in the anterior poliomyelitis of children we have a toxin picking out of the nuclei of origin of the nerves of the voluntary muscles, so we may assume that in this disease we have a toxin picking out the nuclei of origin of the nerves of hearing and sight."[1]

John L., aged 18 years, slater, residing in Edinburgh, was admitted October 29, 1904. From the doctor who had been attending him, the following history was obtained:—

He had become suddenly ill about fourteen days ago with some chest pain, cough, and spit. The fever at the beginning of his illness had been distinctly high, the temperature at certain times reaching 105° F. The physical signs in the lungs resembled those of a broncho or catarrhal, rather than of a croupous pneumonia, viz.: rhonchi and crepitation all over both sides posteriorly, but specially at the right base, where there had also been some impairment of the percussion note. About the eighth or ninth day of his illness the temperature fell suddenly, but this proved to have been a pseudo-crisis rather than a crisis. Fever, rapid pulse, cough, and spit had persisted, and some diarrhea, with pulpy, rather pea-soup looking stools, had occurred. This, with the continued fever, the great emaciation, the dry brown tongue, and the felled appearance of the patient, had suggested the possibility of typhoid fever, and about the eleventh or twelfth day, a "Widal" had been made with negative results. It was then arranged to admit him into the Infirmary.

His doctor informed us also that there seemed to be a family history of tubercle, at any rate that a brother of the patient, aged 8 years, had died of what looked like a rapid tuberculous meningitis, just before this patient had taken ill. Also that the patient himself had had a cough and spit for four months before this illness began.

On admission he was found to be very thin and emaciated—temp. 100.4°, pulse 120, resp. 40. His face was flushed, and he was sweating profusely, and had evidently been so for some time, for sudamina were found all over the skin, especially of the trunk, which showed also a marked red miliary and also petechial rash. His tongue was dry, brown, and glazed, and over his teeth and gums sordes were present. Dried secretion crusts showed also about his eyelids, and the eyeballs were glassy-looking. The abdomen was slightly tumid, and on the day following his admission he had three rather typhoid-looking stools. No splenic enlargement was made out, and his blood showed a leucocytosis to 2400.

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[1] Scottish Medical and Surgical Journal, 1903.

He did not complain of chest pain, but he had a cough with a slight amount of spit, somewhat viscid, but not at all rust-colored like a pneumonic spit. Examination of the spit showed a few doubtful tubercle bacilli and many cocci and diplococci, but no typical pneumococci. Examination of the chest revealed rhonchi and crepitations over both lungs, with a slightly impaired percussion note at the right base.

Urine showed no abnormality, and mentally he was very much felled, and could hardly be roused to answer questions. Pupils were equal and slightly dilated, and reacted to light but slowly. Ophthalmoscopic examination revealed nothing.

On the day after admission his morning temperature was 101.6°, pulse 110, resp. 36, and he appeared in much the same condition. In the afternoon he developed distinct nerve symptoms. Attacks resembling the opisthotonus of tetanus showed themselves. His trunk and limb muscles became rigid, his back arched and his head drawn up, and his chin pointed up. His teeth were clenched. These spasmodic attacks came on at first about every twenty minutes, with intervals of incomplete relaxation. In these intervals he complained of great pain in the head and neck, apparently from the cramp, and also in the epigastrium, probably from diaphragmatic spasm. Kernig's sign was markedly present, the toes were plantar flexed, and the feet arched. On tickling the soles of the feet, the legs could not be elicited, probably owing to the muscular spasm. Priapism was present.

Towards evening these attacks became more frequent and violent. He became distinctly delirious, and appeared alarmingly ill. Lumbar puncture was performed, and 15 c.c. of cerebro-spinal fluid were removed. This fluid, though not spurting out in a distinct stream, came very readily, indicating of course a high tension. This little operation was followed by marked amelioration in all his symptoms. He had no more opisthotonus attacks; he became mentally clearer, and expressed himself as feeling distinctly relieved. Next day he was much better—temp. 98.6°, pulse 88, resp. 32—and the bowels were moved only once. He continued to progress, and though in the few days following he developed a parotitis—right—this did not suppurate. He slowly but steadily improved, and left the hospital for the Convalescent on December 6, 1904.

The puncture fluid was quite clear, showed a slight lymphocytosis, but no organisms, either by staining or culture.

He is now quite well, and he tells us that although he has been liable to a cough in winter-time he has always been strong. Repeated examination of his spit since his recovery has failed to reveal tubercle bacilli.

Lizzie M., aged 24 years, a millworker belonging to Renton, was admitted to the Infirmary on 10th December, complaining of great headache, but in a state of semi-unconsciousness, so that she could give no history of her illness. She was brought in by the police, who stated that that evening she had applied at the shelter for a night's board, but had appeared so ill that ambulance aid had been called in, and she had been sent to the Infirmary. Subsequent inquiries indicated that she had been a millworker, living with her family in comfortable circumstances, but that owing to some domestic squabble she had left home three weeks previously, and had been wandering about since.

As regards previous illnesses, she had had scarlet fever some years before, but had quite recovered. She also had had for some time exophthalmic goitre in a slight degree. In every other way she had been healthy. After leaving home, three weeks before, she had evidently been in bad company, but she presented no evidence of disease, and on her admission there was no evidence of excessive drinking.

After wandering about she had passed the night before her admission in the shelter. There she thinks she had got cold, and next morning she had a shiver, and was evidently feverish. In spite of this, she had gone about next day, and had actually walked some 15 miles, as she says, looking for a place, having during that time very little food. Towards night she felt very ill, with headache and vomiting, and applied again at the shelter. She seems then to have been only semi-conscious, and cannot remember having been brought to the Infirmary.

State on Admission.—She was very flushed and feverish, temp. 101.4° pulse 124, resp. 24. She appeared a well-developed and well-nourished young woman. She had evidently great pain in her head, and could hardly answer questions. Prominence of both eyes was noticed, with slight ptosis of the left eye. Examination of the digestive, circulatory, respiratory and integumentary systems revealed nothing. She was, however, perspiring considerably. As she had passed no urine, a catheter was passed, and about 20 oz. of urine drawn off. It was acid. spg. 1012, and contained no abnormal constituents. The blood was examined, and showed nothing abnormal. As regards the nervous system, no Kernig's sign was noted. The knee-jerks were present, but slight, the pupils were equal, reacting to light but slowly. Ophthalmoscopic examination revealed nothing.

On the night following her admission she slept very little, moaning a great deal, and sometimes crying out, seemingly with the pain in the head. She had no vomiting, but seemed to have great thirst, drinking whenever water was given to her. Next day she seemed in very much the same state, but rather worse—temp. 102.4°, pulse 128. She could hardly be roused, complaining only of the pain in the head.

In the evening, as the patient seemed to be getting worse, lumbar puncture was practised and 22 c.c. were drawn off. The fluid spurted out, indicating great increase in the tension. Immediately after the operation, the patient declared herself very much better, and she shortly went to sleep, sleeping quietly for several hours. Next morning she declared her headache all gone; her temperature had fallen to 99°, her pulse to 112. On the following day she declared herself quite well, and she has now, except for the slight exophthalmic goitre, quite recovered.

Examination of the cerebro-spinal fluid showed no excess of cells, and no organisms, either by staining or culture.

On Thursday, December 15 last, I was asked to see a girl, M. M., aged 16 years, a milliner, who was apparently suffering from some form of meningitis.

Though a little anemic, she had previously been healthy and fit for work.

The history was that on the previous Sunday (December 11) she had been well and out as usual.

On the Monday morning she had been feeling a little out of sorts, with headache, yet had gone to work. She had come home earlier than usual, complaining of headache and feeling ill, and had gone to bed.

Next morning she did not rise as usual, and her mother, thinking she would be all the better for the rest and sleep, did not disturb her. In the course of the day, however, it was noticed that she was very dull and somnolent, and when roused complained of her head. She seems also to have vomited. The doctor was called in, who thought it was some form of influenza, and prescribed phenacetin, which seemed to ease the headache.

Next day, 14th, she was worse—more somnolent, temperature slightly raised, pulse about 90.

On the 15th I saw her, and found her unconscious and incapable of being roused. Her pulse was 90 and variable, her temperature was about 100°. Her pupils were equal and reacted slightly to light; some squinting had, however, been noticed.

Kernig's sign was present, the plantar and knee-jerks were normal, and no paralysis could be detected.

Lumbar puncture was proposed, but before it could be carried out the patient died, the duration of the illness being about four days.

No sectio was obtainable.

A. A., aged 8 years, a schoolboy, was reported to have been in his ordinary good health till April 17, 1905. On that day he was out with his companions in the street, watching a performing monkey, when he suddenly fell to the ground, a little distance from his home. His companions helped him home, and noted that he seemed to drag his left leg and that he was crying out from pain in his head. On arriving home and being put to bed, he became dazed and partly unconscious. When roused, he complained of pain in the head, specially on the right side. On Dr. Thin's arrival he found him lying quiet in bed on his left side in a crouching position, with his arms flexed and legs drawn up; his pulse was 88, temperature 98°. He was unconscious, and did not answer questions, and it was noticed that the left side of the face, the left arm and left leg, seemed paretic. His pupils were dilated, and reacted only slightly to light. He was ordered 2 drachms of magnesium sulphate. In the evening his pulse was 80, respiration 22, temperature 97.6°. It was noted that he had been moving his left arm and leg slightly. He had vomited once or twice, and feces and urine had been passed in bed. Examination of the urine had shown a very slight trace of albumen.

Next day, April 18, he seemed slightly better, being more easily roused. He had vomited several times, but as the day wore on he had called once or twice for the *pot de chambre.* He still complained much of headache. Sensation, considering his dazed condition, seemed fairly normal, and the paresis of the left face, arm, and leg seemed less marked. The pupils were dilated, and there appeared an impairment in the conjugate movement of the eyes to the left. The plantar reflexes were more marked in the left leg; the knee-jerks were absent in both.

On April 19 it was noted that his general condition was much the same. There was no fever, but he had had a restless night, crying out at times. He was very dazed, but yet very irritable as regards light and sound. No vomiting and no movement of the bowels.

April 20.—During the night he was at times restless and cried out. During the day was drowsy, but could be roused to answer a question. Pulse 80, temperature 100°. Occasional flushings of the skin all over were noticed, but no perspiration. Some slight retraction of the head was noticed.

April 21.—Lumbar puncture was performed, and about 9 c.c. fluid was withdrawn. It came away evidently under considerable pressure, but was quite clear. Patient slept for some hours after this.

April 22.—Patient appeared better; he had no headache, but was obstreperous and difficult to restrain, complaining of slight pain in the back, but seeming to move his eyes and limbs better than before.

April 23.— Slept well all night, but very cross to-day; no headache, and is distinctly better in every way.

From this date he gradually progressed, and is now well, although distinctly pale and thin. The cerebro-spinal fluid was examined by Dr. Shennan, and he reported that it contained—

Staphylococcus albus and another staphylococcus—aureus or citreus.

Two bacilli, one like pseudo-diphtheria class, another short with rounded ends.

No diplococci.

In connection with these cases I have said little as regards the organismal or toxic agency probably concerned. Naturally one thinks of the organisms of epidemic cerebral meningitis, of simple basic meningitis of children, or of influenza. Inasmuch, however, as the organisms to which those diseases are ascribed seem, like many other organisms, by their frequent presence in healthy conditions, to vary from extreme virulence to absolute harmlessness in different individuals, and in the same individuals at different times, it is most important to endeavor to interpret in every way the conditions upon which this variability depends. Towards this object, clinical records of cases presenting distinctly unusual symptoms, and following distinctly unusual courses, must conduce, especially when they have occurred and can be appropriately considered in groups. It might therefore serve a purpose to note along with those unusual examples of the more acute forms of cerebro-spinal intoxication which I have seen lately, a number of no less unusual but more chronic forms.

It is evident, however, that such a group would include lesions of every part of the cerebro-spinal axis, from the cerebral cortex cells above, to the peripheral nerves below, and it is equally evident that this would involve the detailed description of a list of cases in which as symptoms, not only disturbances of consciousness, speech, sensation, and motion were present, but cases also which resembled those of encephalitis, transverse, and poliomyelitis, diffuse sclerosis, general paralysis, etc. This would lead me beyond the subject of my paper, so I shall confine mself just now to the detailed description of one case only. I wish, however, here to take the opportunity of stating that within the past two years I have seen examples of all those diseases just named, which have, as regards etiology, symptoms and course, been most unusual.

The case of cerebro-spinal intoxication which I wish now to describe in detail is the following:—

Mrs. S., aged 48 years, residing in Leith, was admitted to Ward 33 on March 20, 1905, in a state of great restlessness and delirium, and with a history of having been ill for over two weeks.

Her previous health had been excellent; she had been an active and hard-working wife and mother, always rather anxious about her household duties, and complaining only of occasional headaches. About three years previously she had had Bell's paralysis for a few weeks, probably as result of cold.

Her family history was good. She has had ten children, all except one being alive and strong.

Her present illness began about the beginning of March. She complained of feeling tired and of headache. It was noticed after a day or two that though she was still going about, she was not speaking in her usual way—she seemed to have difficulty in finding words. She was also not walking so well, and was forgetting things. This was noticed one evening, and next morning, when Dr. Paterson saw her, he found some paresis of the right face and arm, and to a slight extent also of the right leg. She complained also of numbness of the right arm. From this time she was kept in bed.

On March 9 she complained of very severe headache, specially of the right side, and then vomiting came on. At this time, also, she was difficult to rouse, and appeared dazed. All through this period the temperature had remained normal, and the pulse beating quickly, about 76 per minute. In this dazed condition, urine and feces being passed involuntarily, she continued. When roused to speak at times she complained only of the headache.

On March 15, convulsive attacks showed themselves, the arms and legs shook, the face was twisted, and the head drawn back. These began at 2 P. M., and continued every few minutes till 6 P. M., after which time she lay quiet, but absolutely unconscious.

On March 19, lumbar puncture was performed and 9 c.c. fluid withdrawn. The fluid came away drop by drop quite freely, but showing not great tension, and on examination by film and culture it showed nothing abnormal. After this the patient became extremely restless and delirious, trying to get out of bed. She was next day (March 20) sent to the Infirmary. On admission she was exceedingly violent, requiring to he held down in bed. Temp. 100.8°, pulse 108; her face was flushed, and she looked dazed, and paid no attention when spoken to. Sensation seemed to be, considering her dazed condition, unimpaired. No paresis nor paralysis was discoverable, but her right hand and arm were kept continually moving, picking at the bedclothes. Her reflexes, superficial and deep, were very slightly marked, Kernig's sign was slightly present, feces and urine were passed in bed.

There was no strabismus, the pupils were rather small and reacted slowly to light.

Examination of the heart, lungs, and other organs showed nothing of note. The urine showed no abnormal constituents, and there was no leucocytosis. In this condition she remained all day, and in the evening chloral and bromide of potass were given. This quieted her a little, but she never slept, and kept continually moving her right arm, picking at the bedclothes. Next day her condition was practically the same. Lumbar puncture was performed, and 17 c.c. were withdrawn. It was noted that the flow showed slightly increased tension, but the fluid had a normal appearance, and showed neither leucocytes nor organisms. This puncture seemed to do her some good. She was much quieter, and by night she was able to tell her name, and to push out her tongue when asked to do so. It was noted, however, that she took a long time to do this, and that she still looked dazed, and kept moving her right arm and hand. That evening she slept a good deal.

On March 22 she was distinctly better. She answered when spoken to, but after a long time. She complained of pain in her head. She also asked for the bed-pan for the first time. On this day too a more careful ophthalmoscopic examination of the eyes was made, and revealed as before nothing abnormal. From this date she seemed steadily to improve, but still complaining of headache, mostly on the right side. She began to take some interest in what was going on in the ward, and was able to state that she remembered absolutely nothing of her illness.

The next entry is April 7, 1905.

The patient has been apparently well. Pulse and temperature normal. She has been quite sensible, and has been up and moving about in the ward. For the last day or two, however, she has been complaining of a return of her headache, and as yesterday the headache was still more marked, she had the static douche for a few minutes. She expressed herself as feeling better after it, but to-day on getting up she felt it so bad that she had to go back to bed. In the afternoon she vomited, and soon after relapsed into a soporific condition. She did not seem to hear anything said to her, and if she did reply it was done very slowly.

April 8.—Patient in same condition; cannot feed herself and passing urine and feces unconsciously. Pulse 84, temp. 97° to 98° F.

April 9.—Patient appears worse; very somnolent; pupils rather contracted; vomited in the afternoon. With her somnolence a somewhat increased muscle and nerve irritability was noticed, *i.e.* on stimulating the skin and limbs were jerked more vigorously than before. Pulse 76, temp. 96.4° to 97.4°. Lumbar puncture again performed and 2 c.c. withdrawn; no tension. Film showed a normal field.

April 10.—Patient much as yesterday, but some twitching of muscles of arms noted. Pulse 76, temp. 96° to 97°.

April 11.—Patient much as before, but marked twitching and movements of arms, especially of the right. Said "Good-morning" once when spoken to, then relapsed into the usual somnolent state. Pulse 100, temp. 97.6° to 98.6°.

April 12 and 13.—General condition unchanged. Flushing of face from time to time noted. Pulse 68 to 80, temp. 97° to 98.4°.

April 14.—Patient much as before, but twitching of arms less, and on several occasions seemed to understand what was said to her, and spoke a few words. Her relatives believed that she recognized them. Pulse 64, temp. 97° to 98°.

April 15.—At 8 A.M. appeared better. At 9 A.M. she suddenly became cyanotic, and violent twitchings of the arm occurred. These showed themselves at intervals, and at 3 P.M. a specially violent attack came on, involving the right arm and leg chiefly. Chloroform was administered to allay this. Pulse became rapid and feeble, temp. rose to 102.2°. Profuse sweating occurred, the bronchi became filled with secretion. With the chloroform the twitching stopped, but she remained cyanosed, and Cheyne-Stokes breathing occurred, the pauses lasting for 20 seconds. In the course of the evening the pulse became absolutely imperceptible, and she died at 11 P.M.

On post-mortem examination, beyond very intense hyperemia of the grey matter at parts, in the pons, medulla, and cord, nothing distinctive was found. Microscopic examination showed also no distinctive changes in the nerve tissue.

CLINICAL OBSERVATIONS ON DIPHTHERITIC PARALYSIS.[1]

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HISTORICAL.

Though the history of diphtheria under various names can be traced back to remote antiquity, no detailed account of its paralytic sequelæ is to be met with before the middle of the nineteenth century. Passing allusions, however, are to be found at a much earlier date. According to Sanné, Hippocrates[2] had observed it. Aretæus of Cappodocia (1st century A.D.,), whose vivid picture of laryngeal diphtheria, then known as the Syriac or Egyptian ulcer, is still unrivalled, makes no mention of it.

Cœlius Aurelianus[3] (end of 3rd century A.D.), in his chapter on Cynanche, speaks of confused and inarticulate speech, lividity, weakness of pulse, and regurgitation of fluids, as signs of a fatal termination. Heredia[4] (*De Angina Maligna,* 1890), in dealing with the epidemic in Spain at the commencement of the 17th century, records paralysis of the palate, pharynx and limbs. Herrera,[5] his fellow-countryman and contemporary, alludes to the peculiar sound of the voice, which he compares to that found in syphilis.

Œtius Cletus,[6] in his preface to his book, *De Morbo Strangulatorio,* based on observations on the epidemic in Italy which prevailed subsequently to that in Spain, relates that "of those who gain their former health in the course of a year more or less, almost all speak indistinctly and have difficulty in swallowing."[7]

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[1] A dissertation for the degree of Doctor of Medicine in the University of Oxford.

[2] Epidem., Lib. VI. An epidemic cough at Perinthus . . . characterized by great tendency to relapses, and complicated with pulmonic affections, nyctalopia, angina and paralysis.

[3] "Loquutio non articulata sed confusa atque cum dolore. Si in exitium passio cœperit ferri, livor vultus, vocis amputatio, gutturis atque pectoris stridor, et recursio sive recursus poti liquoris, pulsus defectio, quem græci asphygmiats vocant." De ac. Morb., III., 2.

[4] Quoted by Sanné, Diphtérie, p. 6.

[5] Quoted by Greenhow, Diphtheria, p 18 (1860).

[6] Squire: Reynolds' Syst. of Med.

A definite relation between the faucial attack and the subsequent paralysis was not demonstrated before the middle of the eighteenth century. Chomel, dealing with the epidemic at Paris in 1743, Ghisis with that at Cremona in 1749, and Samuel Bard with that of New York in 1789, each describe cases.

It is a surprising fact that nearly a century elapsed before the remarkable observations of these three writers were confirmed by subsequent clinicians. Bretonneau,[8] who first established diphtheria as a specific disease, quotes the cases of Bard and Ghisi, and himself records the history of Horpin, surgeon at the hospital at Tours, who after a severe attack of diphtheria suffered from amblyopia, nasal voice and regurgitation, difficulty in walking, and disordered sensation. The case is cited, however, not on account of the paralytic phenomena, but in proof of the contagiousness of diphtheria, and dismissed with the following brief comment: "The lesion of motility, the alteration of the blood and the innervation, and the prolonged weakness, are the too frequent consequences of nasal diphtheria that has passed into the chronic state."

The first monograph on diphtheritic paralysis was by Maingault of Paris.; in 1854 appeared as an Inaugural Thesis his paper entitled "De la paralysie du voile du palais à la suite d'angine." The affection according to him was rare: he had only seen six cases. He sums up the principal symptoms under five heads:—(1) nasal voice, (2) regurgitation of fluids by the nose, (3) difficulty of suction, (4) impossibility of inflating the cheeks, (5) local alterations, viz., immobility, anesthesia and analgesia of the velum palati. His more important work, *"Sur les paralysies diphtéritiques,"* appeared in 1860. Between 1854 and 1860 several isolated cases of various diphtheritic palsies had been described by various observers, especially by Trousseau, so that he had now collected 90 cases, 29 of which were in children, with a mortality of 12. His classification is of interest, and is as follows:—

Paralysis of palate	70 cases
Generalized paralysis	64 "
Amaurosis	39 "

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[7] Greenhow: Loc. cit.

[8] Fifth Memoir on Diphtheria, 1855, New Sydenham Soc., p. 182.

Paralysis of lower limbs	13	”
Strabismus	10	”
Paralysis of trunk and neck-muscles	9	”
Anaphrodisia	8	”
Affection of sensation without muscular weakness	8	”
Paralysis of rectum	6	“
Paralysis of bladder	4	”

From these observations he drew the following conclusions:—

(1.) Numerous facts prove the existence of a variety of paralysis which merits the name of diphtheritic paralysis, occurring in convalescents from pseudo-membranous affections, and evidently the consequence of the primary affection.

(2.) The paralysis may be local, *e. g.*, of palate of pharynx.

(3.) It often affects distant parts. It is sometimes limited to the lower limbs (paraplegia), sometimes generalized and progressive.

(4.) Mild diphtheria may be followed by grave and extensive paralysis.

(5.) Albuminuria is by no means the cause of the paralysis, because in some cases there never has been any albumen in the urine.

(6.) Diphtheritic paralysis may be the result of disordered innervation without appreciable lesions of the nervous centers.

(7.) Generalized paralysis may end fatally, but usually recovery takes place in a lapse of time varying from two to eight months.

(8.) Diphtheritic paralysis is essentially progressive. It never reaches its maximum intensity at once.

(9.) The treatment should be tonic, and consist of electricity, frictions of skin, sea baths, iron, quinine, and strychnine.

Maingault was followed by a host of other observers, of whom the best known were Trousseau, Duchenne de Boulogne, Charcot, and Vulpian in France; Jenner and Greenhow in this country.

The most remarkable description is unquestionably that of Trousseau, who had done much to stimulate Maingault's work. In it he points out that the affection is by no means a new one, but that like albuminuria and leucocythemia it had only recently been studied. Though Bretonneau, his master and friend, in relating the case of Herpin had said, "C'est une paralysie diphtérique," up till 1862 Trousseau himself had regarded the paralysis following diphtheria as a mere coincidence. In that year a generalized paralysis, starting with affection of the palate, in a young American girl who had had a severe faucial attack, made him devote special attention to the subject, and caused him to recognize the truth of Bretonneau's words.

Trousseau[9] described two distinct forms of diphtheritic paralysis: the one malignant, fortunately very rare, invariably fatal, and characterized by affection of respiration, vomiting, delirium, convulsions, and general exhaustion; and the other a mild form usually ending in recovery. In proof of the specificity of the paralysis he cites an instance of its following cutaneous diphtheria, and compares it with similar palsies subsequent to small-pox, enteric fever, and typhus, and also with those following intoxication by lead and carbon disulphide. While admitting that paralysis was more frequent after severe faucial attacks, Trousseau declared that it bore no relation to the intensity, extent, and persistence of the local disease.

The first histological investigations as to the nature of diphtheritic paralysis were made by Charcot and Vulpian[10] in the case of a woman who had died with palatal paralysis. They showed that the motor nerves alone were affected, and consisted of tubules entirely devoid of medullary substance. The neurilemma contained numerous granular cells, mostly elliptical in shape and in some cases nucleated. A few of the muscular fibres were fatty. The sensory nerves showed no signs of alteration.

Of subsequent writers in the next decade, Sanné (*Traité de la Diphtérie,* 1877, pp. 151-175) deserves to be consulted. Morell Mackenzie's book (*Diphtheria, its Nature and Treatment,* 1879, pp. 38-43) contains a good résumé of previous work. Cadet de Gassicourt (*Traité clinique des Maladies de l'Enfance*) devotes several chapters to the consideration of diphtheritic paralysis based on his own careful observations.

The discovery of the specific organism of diphtheria by Klebs and Löffler in 1883 gave an impulse to a fresh series of investigations. The characteristic sequelæ were produced by

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[9] Clinique Medicale de l'Hôtel Dieu de Paris, Vol. I., 494-521. Seventh edition, 1885.

[10] Comptes rendus de la Société de Biologie, 1862.

Roux and Yersin[11] in animals by injection both of the bacilli and of their toxins. The work of these two observers was confined and extended by Brieger and Frenkel in Germany, and by Sidney Martin in England.

The introduction of the antitoxin treatment in 1894, followed by an increase in the number of paralyses observed, has led to the publication of several monographs and of collected statistics dealing with the subject. Of the latter the figures issued each year by the Metropolitan Asylums Board, derived from the observation of about 7,000 cases annually, are of the greatest value, and will be referred to below.

FREQUENCY.

Since diphtheritic paralysis first engaged the attention of the medical world, the records of its relative frequency have varied considerably. This was particularly so in earlier times.

The first compilations consisted of too small a number of cases to be of great value. In 1877 Sanné collected statistics of observers in which the percentage varied from 66 to 1. He himself had met with it 155 times in 1,382 cases, a percentage of 11. Cadet de Gassicourt in 1887, in 937 patients found 128 paralysis-cases, a percentage of 13.6. On excluding from the total those cases of croup that died directly after the tracheotomy, and the toxic cases that succumbed before paralysis had had time to develop, the percentage rose to 23.76.

The causation of these discrepancies is somewhat complex. First, before the general recognition of Klebs-Löffler bacilli, a large number of cases of diphtheria must have escaped notice as such, especially of the milder cases, which are less liable, as will be shown below, to be followed by paralysis. This explains the high percentage of paralysis given by some observers, and accounts for Greenhow, writing in 1860, saying: "Few persons recover without impaired voice or power of deglutition." Secondly, in pre-antitoxin times a much larger number than at present died before the paralysis had time to develop. Thirdly, many patients, whether in hospital or private practice, withdrew themselves from medical observation when convalescence was established, and any subsequent paralysis that developed was often too slight to attract the notice of the patient or his friends.

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[11] Annales de l'Institut Pasteur, 1888, 1889.

Fourthly, the predominance of paralysis in young children made its presence more likely to escape notice. Definite paralysis was undoutedly regarded in many instances merely as asthenia supervening on a severe illness. Fifthly, we must take the personal factor into account. Even to-day it is easy, unless special attention be paid, to overlook some slight forms of diphtheritic paralysis. Such oversights were probably more common in earlier times, when the phenomena were less familiar, than they are now.

Since the employment of antitoxin there has been a greater uniformity in the records of the relative frequency of paralysis. In Table I. is represented the percentage of paralysis-cases met with for the last seven years in the hospitals of the Metropolitan Asylums Board. The figures show that for the first four years following the introduction of antitoxin the percentage remained the same. Within the last three years it has been somewhat reduced.

TABLE I.

Year.	*Diphtheria Patients.*	*Paralysis Cases.*	*Percentage.*
1895	3,635	743	20.4
1896	4,296	833	20.5
1897	5,493	1,129	20.55
1898	6,326	1,229	19.42
1899	8,310	1,701	20.0
1900	8,238	1,526	18.50
1901	7,690	1,553	20.19
1902	6,863	1,172	17.07

My own figures, based on the observation of 500 cases that have been under my care throughout their illness in the Grove Hospital, give a somewhat higher percentage, viz., 23, or 115 cases.

RELATION TO THE CHARACTER OF THE INITIAL ATTACK.

A not less disputed question is the relation of the subsequent paralysis to the character of the faucial involvement. The great majority of writers, *e. g.*, Greenhow,[12] Squire,[12] Mackenzie,[12] Wilks,[13] Gowers,[14] Gee,[15] and Trevelyan,[16] are of opinion that there is no proportion whatever between the two. Some, indeed

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[12] Loc. cit.

[13] Clinical Lectures on Diseases of the Nerv. Syst.

[14] Dis. of Nerv. Syst.

[15] Allbutt's System of Medicine, Vol. I.

[16] Lancet, 1900.

e. g., Trousseau, admit that paralysis is more common after severe attacks of diphtheria, but that mild cases are by no means exempt. Henoch[17] and Jacobi[18] go so far as to say that mild attacks are more liable to be followed by paralysis than severe.

A small but important minority, *e. g.*, Cadet de Gassicourt,[19] Caiger,[20] Goodall,[21] and Woollacott,[23] cling strongly to the directly opposite view, viz., that the severe attacks of diphtheria are more liable to be followed by paralysis than the mild. It is significant that the last three named belong to the medical staff of the Metropolitan Asylums Board's Fever Hospitals, to which patients suffering from diphtheria of all degrees of severity or mildness are sent, and where, owing to abundant accommodation, they may be detained long enough for the characteristic sequelæ to develop, instead of, as in the crowded French hospitals, being discharged as soon as the acute symptoms have subsided and convalescence attained.

Similar testimony has been given me by other medical officers and nurses, who have been many years in the Board's service, and who have had many thousands of cases of diphtheria—the mildest, the most malignant, and all intermediate degrees—under their care.

My own statistics serve to confirm the evidence of my senior colleagues (see Table II). It has been my unvarying practice to place each of my cases in one of six classes as soon as the throat became free of membrane. The classification was determined by the extent and duration of exudation on the fauces, indicated daily by filling-in the position of the membrane on a diagram, the presence and degree of nasal involvement and fetor, and not least by the concomitant adenopathy, which in the most severe cases forms what the French, by a classical reminiscence, designate *cou proconsulaire,* and in less severe forms presents all grades of affection, down to that slight degree in which the glands at the angles of the jaw are just palpable and slightly tender.

None of my patients died before the throat became clean. except in the most malignant cases, and these were nat-

[17] Dis. of Children, New Syd. Soc.

[18] Twentieth Cent. Pract., Vol. XVII.

[19] Loc. cit., Mild forms followed by 18 per cent.; severe forms followed by 22 per cent.

[20] Allchin's Medicine.

[21] Brain, 1895.

[23] Lancet, 1900, and M. A. B. Reports, 1898.

urally ranged in Class I. entitled "very severe." The majority of the patients in this class recovered, but the mortality was high (43.5 per cent.). Class II. consisted of cases where the membrane was less extensive, and the adenopathy, rhinorrhea, and fetor less marked. A certain number of these died within the first fortnight of cardiac paralysis, but none before the membrane had disappeared from the fauces. The mortality in this class was 14.5 per cent. The remaining four classes designated respectively as "moderately severe," "moderate," "mild," and "very mild," contain no fatal cases, and consist of cases gradually diminishing in severity, till Class VI. is reached, in which I have placed all patients in whom the slight degree of faucial involvement rendered the administration of antitoxin unnecessary.

I am well aware that the classification is to a certain extent arbitrary, and that the determination of any particular class must vary according to the personal factor; but what I particularly wish to insist upon is that I allocated each case directly the throat became free of membrane by writing down on the patient's bedcard the character of the attack, and was never influenced by the appearance of subsequent paralysis to alter my previous estimate of the case.

TABLE II.

(Showing Relation of Paralysis to Character of Initial Attack.)

A.—Faucial Cases with or without Nasal and Laryngeal Involvement.		Paralysis Cases of all Kinds.	Percentage.	Severe Paralysis Cases.	Percentage.
Class I. Very severe	39 cases	32	82.05	23	58.9
Class II. Severe	96 "	49	51.04	25	26.04
Class III. Moderately severe	40 "	7	17.5	0	—
Class IV. Moderate	152 "	22	14.4	3	1.9
Class V. Mild	144 "	5	3.4	0	—
Class VI. Very mild	24 "	0	0	0	—
Total	495 cases	—	—	—	—

B.—Nasal cases only:

1 moderate,
1 mild,
1 very mild.
} followed by no paralysis.

C.—Laryngeal cases only.

Two severe, *i. e.*, requiring tracheotomy; no paralysis.

Table II. clearly shows how very direct is the relation between the character of the attack and the subsequent paralysis. The entire absence of any paralysis in Class VI., and its gradual increase in frequency and severity as we mount the scale, speaks for itself. In no instance did the very mild cases by their subsequent behavior make me regret my abstention from specific treatment. The only complication that any of them had was a trace of albumen lasting for a few days at most.

Of the thirty-nine very severe faucial cases, five patients died of toxemia before any paralysis had developed. Only two in this class, a male aged 20 and a female aged 26, discharged on the sixty-second and forty-fifth day of disease respectively, had no paralysis.

How can we account for the discordant opinions prevailing on the relation of subsequent paralysis to the primary lesion? Woollacott's[23] suggestion that too much confidence has been placed in the patient's own description of his condition offers one explanation. In the severer forms, especially in children, painlessness is a striking feature, as was pointed out by the Spanish physicians[24] of the seventeenth century in their description of diphtheria, then known as *Garotillo* or *morbus strangulatorius,* and since then by numerous observers. The entire absence of pain in the toxic forms often makes the parents, and occasionally even the doctor, ignore the faucial condition, and regard the child as suffering from mumps; and it is only the supervention of the characteristic fetor and coryza, and an extreme degree of prostration, that prompts an examination of the throat and leads to a more correct diagnosis. My own experience has been that it is not so much the cases in Classes I. and II. as those in Classes III. and IV. that suffer most from pain; it would thus seem that the tendency of the diphtheritic poison was analgesic.

It is important to realize that diphtheria, like other acute specific diseases, tends to a spontaneous recovery, and does not, as Bretonneau thought, invariably kill the patient unless art intervenes. Hence, not infrequently severe attacks may escape the doctor altogether, until he is called in on account of the paralytic sequelæ. The absence of a history of severe faucial pain leads to the mistaken belief that the initial attack was mild. The degree of the primary faucial lesion can often be gauged with some accuracy for several days, sometimes weeks, after the membrane has gone by the opaque appearance of the mucosa, due to the superficial necrosis of the epithelium, which sometimes, though rarely, amounts to marked loss of tissue. The opacity indicates the site of the pre-existing membrane, and is thus a valuable guide to the nature of the initial attack.[25]

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[23] Lancet, 1900.

[24] Fontecha: "Aliquando incipit cum parvo dolore" (De anginarum naturis). Villa Real: "Ego vero, qui millies vidi hos ægrotantes, statim in primo insultu morbi conspexi iam frustum in faucibus gulla aut gutture, nulla prius, dicente ægro, sensata lesione. (De signis, causis, essentia, prognostico et curatione morbi suffocantis.)

In pre-antitoxin days the membrane was often very persistent. Even to-day, in spite of large doses of antitoxin, a long time may elapse before complete regeneration of the mucous membrane takes place. In one of my cases that received 36,000 units the mucosa did not regain its normal appearance until the twenty-sixth day of disease, *i. e.,* the twenty-second day after the injection of antitoxin.

Though as a rule there is a definite relation between the initial disease and the frequency and degree of subsequent paralysis, on the other hand paralysis, severe in nature and possibly fatal, may follow mild attacks, when the faucial lesion has been neglected and the case has been ambulatory throughout, or the recumbent position has not been maintained for any length of time. The perusal of the histories of those cases where extensive paralysis has followed an undoubtedly mild attack has convinced me that the patient was allowed to return too soon to work, often of an arduous character.[26] There is no doubt that the enforcement of rest for a certain period of time following the initial attack is the surest prophylactic against subsequent paralysis. The amount of rest required varies according to the severity of the primitive lesion. Strict confinement to the recumbent position is needed for a longer time after a severe than after a mild primary disease. There is a greater tendency for untreated or maltreated cases to develop paralysis than for those that have been kept in bed and lying down from the outset. Keeping the patient recumbent is often enough to ward off paralysis completely in the milder forms, and to render it less extensive in the severer. This no doubt is the reason why in the Asylums Board's Fever Hospitals paralysis is less frequent, after the mild forms of diphtheria, and why in private practice, in general hospitals, and in hospitals for nervous diseases where the patient may first seek advice some time after the acute attack, mild initial lesions are followed by severe paralysis.

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[25] Vide Cases I, IV, V, VI, VII, IX, X, XI, XII

[26] This applies particularly to the descriptions of Maingault and Trousseau (loc. cit.).

Table III. represents the average, and also the maximum and minimum, number of days that my patients were kept recumbent.

The explanation of the great variation between the maximum and minimum number of days during which the recumbent position was enforced is the following. Some of the mild cases developed a certain degree of irregularity of cardiac force and rhythm. While this lasted many were kept lying down. Some of the very young children insisted on sitting up without waiting for permission soon after the acute symptoms had subsided. In such cases I thought more harm would result from forcibly restraining them than from letting them have their own way. My experience has been that infants and very young children do not attempt to raise themselves unless it is safe for them to do so.

TABLE III.

	Average.	Maximum.	Minimum.
Class I.	42.9	72	25
Class II.	35.1	63	10
Class III.	25.2	47	19
Class IV.	23.3	61	11
Class V.	19.9	53	6
Class VI.	14.8	22	10

This is not so much the case in older patients, but even in them illicit sitting up is sometimes a sign of good omen, and can be best checked by moral restraint alone.

With Table III. it is interesting to compare Table IV. which shows the average duration of stay in hospital for the various classes.

TABLE IV.

	Average. Days.	Maximum.	Minimum.
Class I.	69.2	98	43
Class II.	59.6	105	25
Class III.	46.4	95	22
Class IV.	45.1	111	23
Class V.	48.07	128	24
Class VI.	32.3		19

Several patients in Class V developed scarlet fever during convalescence, thus accounting for the slight excess in their stay in hospital over those in Class IV.

RELATION OF PARALYSIS TO LARYNGEAL DIPHTHERIA.

This is a less vexed question than either of the preceding. Most writers are, I believe, unanimous that purely laryngeal diphtheria is rarely, if ever, followed by paralysis. It must, however, be remembered that laryngeal cases, severe enough to justify surgical interference by tracheotomy or intubation, may be followed by considerable paralysis, sometimes ending fatally. In all my cases, however, in which laryngeal diphtheria was followed by paralysis, the concomitant faucial exudation was of some extent. Though purely laryngeal diphtheria is comparatively uncommon—I have only two among my 500 cases—in the majority of my tracheotomy cases the faucial membrane was not extensive. It is a striking fact that the type of disease represented in Class I. tends to spare the larynx, at most the tip of the epiglottis being fringed with membrane.[27]

TABLE V.

Tracheotomy-Cases showing character of faucial attack and subsequent palsy.

9 mild faucial cases	No paralysis.
4 moderate faucial cases	1 slight paralysis (nasal voice).
4 severe faucial cases	1 severe paralysis.[28]
4 severe faucial cases	1 slight paralysis (squint).
1 very severe faucial cases	Cardiac paralysis.
2 purely laryngeal cases	No paralysis.

RELATION OF SEX TO PARALYSIS.

According to Woollacott males and females are equally affected. My own figures give 58 males and 57 females. As the total 500 consists of 227 males and 273 females, this works out to a percentage of 25.4 for males and 21.3 for females. In severe attacks the incidence on males is higher still; 10.9 per cent. for males, 5.8 per cent. for females.

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[27] Cases VII, XIII.

[28] Case XV.

(*To be continued.*)

SOME USEFUL PRINCIPLES IN THE TREATMENT OF CEREBRO-SPINAL MENINGITIS.*

By William Browning, Ph.B., M.D.,

of Brooklyn, Professor of Disorder of the Mind and Nervous System at the Long Island College Hospital, Brooklyn, N. Y.

While we are all hoping that the bacteriologists may come to our aid with a specific serum, or that the New York Health Board's Commission may at least point out ways of prevention, the practitioner is in need of guiding principles in making the best fight possible for his patient. Though the present epidemic is rapidly waning, we are bound to have cases other seasons.

In the first place it may not be amiss to correct some of the popularly distributed misinformation. We understand this as well as most diseases, its causes, symptoms and pathology. It is only with regard to its spread and to improved methods of cure that more light is needed. Even in its treatment we are doubtless as successful as, e. g., in typhoid fever. That disorder we have no means of definitely aborting, and it can hardly be claimed that our management of itself is creditable with more than a portion of the recoveries. As to spotted fever, it is a more dangerous and fatal disorder than typhoid; but by judicious care we can apparently increase the number of cures quite as much as in the latter malady.

In the *Brooklyn Medical Journal* for May, 1904, is given a history of what is known regarding the occurrence of this disease in my town, with some facts and considerations to extend our knowledge on mooted points. I now wish to consider the therapeutic side, on the basis of personal observations for a number of years but more particularly during the epidemic of the last two.

The outlook is in fact so much better that I now regard a case with less of that feeling of dread, uncertainty and helplessness that has too largely paralyzed our efforts. A degree of optimism in itself favors the chances of success.

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* Paper read before the Windham County Medical Society, 1905.

Whatever other agencies may be resorted to, there are certain general lines of treatment that prove of definite aid when promptly initiated and systematically pursued. Simple as they may seem, it is difficult at first to make their importance fully realized. Some cases it is true, run so rapidly fatal that there is no time to apply any plan;[1] but in the large majority there is opportunity enough.

The points it is desired to emphasize may be summarized under certain heads:

LIGHT AND AIR.

While this has not been considered a filth-borne disease many facts, sufficiently pointed out in the previous paper, show that the crowding of people in close quarters, as often on shipboard or at military barracks or in tenements, favors the outbreak of cases. Wintry and stormy weather in this way plays a role. Nearly all the cases that I have seen were in foreign-born or in their children, and we know the great fear in continental countries of sleeping by an open window. Ventilation hence assumes a large place in prophylaxis.

Then the bacteriologists teach that the germ is easily destroyed, that it is killed by a temperature of but fifty-eight C., or thereabouts, and that dryness and light are not conducive to its welfare.

It is a matter of observation that with the advent of warm weather, the opening of dwellings to air and daylight and the scattering of in-dwellers, an epidemic subsides.[2] In the case of the patient it is imaginable that these same allies may extend their beneficent action to the deeper and infected tissues, as well as protect from additional infection. Thus it appears from every point of view advisable to have the patient's quarters well ventilated (*also carefully warmed,* if the weather be cool), and flooded with all the sunshine available. Put the patient right in the sunlight if not too hot. If any photophobia, shade the eyes and turn the head of the bed towards the light. Whether a coincidence or not, most of the cases that I have seen in sunny and aired rooms have eventually done well, while those in dark-curtained and unaired rooms have oftener done otherwise. Consequently I determined on making this a leading feature in management, and apparently with benefit.

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[1] Those dying in a day or so appear to be a special class. In my experience they show, strangely enough, the greatest amount of pus in the membranes of both cord and brain, far exceeding anything seen in longer cases; despite Councilman's statement (Journal American Medical A., 1905, April 1), that, "In the most acute cases, those dying in a few days after the onset, there may be a little more than intense hyperemia of the vessels in the meninges and cortex." Pneumonia and strepto-coccic meningitis he figures as always fatal, but not clinically distinct. My cases of the rapid kind suggest some special cause, as a mixed infection. In one, this spring, no organism was found in the spinal fluid, though polymorphonuclear leucocytes. In the ventricular pus at the autopsy, however, the meningococcus was abundantly present, and also another form.

[2] It almost seems as though the break from winter living were first attended by an increase of cases, and then by the rapid decline in the epidemic —though there are difficulties in establishing a general chronology.

(According to current reports, papers of May 1, Dr. Ruhemunn of Berlin "connects the spread of cerebro spinal meningitis in Central Europe with the uncommonly short periods of sunshine which have been recorded over this region from October to the present time." And the same view has since been publicly approved here).

QUIET, OR RELATIVE IMMOBILIZATION.

If we have a sore finger we know that it will be made worse by use, and the same here if we agitate the inflamed parts. This is the key-note of the old opium treatment. And this agent (or its alkaloids) is still the main and most useful internal remedy.[3] Its purpose it to soothe the patient and relieve the pain; for there is a great inclination to be fretful, crotchety, restless and generally hyperesthetic. Pain always tends to increase the muscular tension, and that is too high in these cases anyway. Bromide and the soporifics are of little relative or actual value.

In harmony with this are a number of measures to advance the patient's comfort and avoid disturbance. Transportation is specially harmful, although removal to a hospital must often be permitted. Usually within twenty to thirty hours thereafter, a decided rise in the temperature may be noted, with exacerbation of the condition in most respects. Moving about from one room or ward to another may likewise be followed by retrogression. *This general and important fact has perhaps been overlooked as the interval of time distracts our attention from the sequence.*

If in a noisy place cotton may be put in a child's ears, but a quiet spot is far better. It is a striking fact in this connection that cases with deafness (usually an early complication if at all) are very apt to recover. Where the child goes to an institution, it may be a great advantage to have the mother admitted with it.

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[3] Moody, of Mobile (American Medicine, 1905, April 15), lauds iodide of potash in frequent doses.

The bed is often a source of unnecessary discomfort to the patient. There may be such a settling down in the middle that even a well person could not possibly lie out straight with any ease. And with the extra tension in the muscles here, the sufferer is continuously on the rack. A slight incline towards the foot of the bed is of some advantage also in favoring the gravitation of body fluids away from the head. In an adult case last year, that terminated fatally some four months after the onset, while the cerebro-spinal fluid was otherwise clear, at the apex of each post-cornu was found a purulent gelatinous deposit (the organism no longer present); apparently this might have been avoided.

While changes of position, for this purpose and to relieve pressure and hypostasis, must be made, all unnecessary movements as lifting in and out of bed for bath are to be scrupulously avoided. Keep unnecessary persons out of the room, both for quiet and to keep the air at its best.

Go very slow in convalescence; at least a week in bed after the rectal temperature keeps to or below 99 degrees. Then bolster up in bed for brief periods; the pulse may go up some with less concern, but any distinct rise in temperature means longer waiting before trying it again. Too early or rapid attempts at getting about bring trying relapses. There may also be digestive troubles on attempting to enlarge the diet, that are easily misinterpreted.

RELIEF OF CEREBRO-SPINAL CONGESTION.

Various methods conduce to this end. Warmth to the surface is the chief.

A correspondent of the *New York Times*, under date of April 20, 1905, writes of a successful remedy applied in Michigan "in the winter of 1848." It was "steaming the patient with hemlock. . . . Done by placing one end of a tin conductor, three or four inches in diameter, in a laundry boiler of water which contained hemlock, placing the other end of the conductor in the patient's bed until thorough perspiration had been produced. . . . Not a death occurred under this treatment." Except for the hardly necessary addition of hemlock, this describes a most admirable form of treatment, and an improvement on what is now termed the hot bath.

These patients tend to cool extremeties and a chilly surface generally; and this in turn enormously aggravates the meningeal condition. Almost any system of heat to the surface below the neck is useful. Small children can without so much harm be gently picked up, put in a bath and as carefully returned to the cot. But in adults this, while giving a most encouraging temporary relief, so far violates the essential of rest that by the next day they are as badly or worse off than before. With them and older children, however, if we apply the heat in bed we can also keep it up more continuously, and can get satisfactory results. Often, hot bran bags can be packed from sole to axilla, and with avoidance of the chance of burning. Or as one colleague prefers, use bags of oats, since they retain the heat longer.

At times when the temperature runs too high, a cold pack can be given in bed, and this, by the return to hot pack brings an added reaction as well.

A complementary measure is that of lumbar puncture, introduced into this country by the writer in 1893-4. Aside from diagnosis, this has here an occasional therapeutic value. Vomiting, which, however, may be only an early-stage symptom, seems amenable to it. And if the pulse also gets slow or there is other indication of pressure, or an intractability to other means, there is the more indication to resort to it. Otherwise even continuous spinal drainage has not fulfilled its early promise of usefulness. I have tried it in all ways, and can but come to this conservative estimate of its worth. If done, be careful to test the strength of the needle before use, as I have repeatedly known of it breaking off subcutaneously.

Small blisters along the borders of the occipital and temporal scalp may relieve brain-irritation, serve to clear up consciousness, and ease involvement of cranial nerves.

Of course besides these three main indications, there are the usual attentions: adequate nourishment, a watch for retention and impending bedsores, chloroform for convulsions, in anemic convalescents the iodide of iron, etc.

By combining these various methods a good share of the children can be pulled through, and even the adult mortality considerably reduced. One apparent effect of this plan is that the cases pursue a more regular course, a variable high temperature early in the case, with gradual subsidence. Sequellae however still occur.

The proper care of these cases is a very arduous task, especially for a nurse, and a change is apt to show itself in a set-back until the new one has gained the methods. You may say this whole plan is simply nursing; but it is special nursing applied rationally and in a developed manner. It certainly requires but limited resort to drugs. Stimulants are often required in the later course. And many a case that recovers will pass through periods of collapse that seem terminal.

Only rectal temperatures are of value.

DISINFECTION.

In the matter of personal disinfection information has been wanting. Sunlight and plenty of dry air appear sufficient. We know, however, of no danger of contamination from person to person (contagion). Where more than one case occurs in the same house they are apt to develop it so nearly at the same time that there can hardly be a suspicion of one catching it from the other. The few possible cases cited by Dr. J. C. Wilson (*Journal American Medical Association,* April, 1905), have no demonstrative value; moreover, such rare coincidences are to be expected as a matter of mathematical chance.

From experiments it appears that the morbific agent is not transmitted through the blood circulation. This negatives Professor Verrill's suspicion regarding the bites of fleas or other insects. Such experimental evidence, the fact that affections of the upper air-passages or ears are so common immediate antecedents of this meningitis, and finally the finding in certain cases of the meningococcus in the nasal, ear, or accessary cavities, make the channel pretty clear by which an individual becomes infected.

Inasmuch as the mucous membranes like the skin are tolerant of such a rise in the external temperature, it is probable that the simplest and best nasal disinfection could be gained by the passage of a current of air heated to 58-60 C.

As a matter of common cleanliness and to avoid chance of harm, fluid from spinal puncture, objects moistened with it, nasal secretions of affected patients, and the contents of any herpetic vesicles (which have been found in some of the Brooklyn and foreign cases to contain the organism) may be subjected to ordinary methods of disinfection.

The highest lesson of modern surgery is not antisepsis, but that to obtain results in any department of the healing art it is necessary that our measures for relief be carried out promptly, thoroughly and unquestioningly. The surgeon calls for a novel instrument, a special dressing, some new antiseptic, or even a many-thousand dollar operating-room—and the administration is discredited if it does not establish a new record for reaction time. But let the medical side ask for a small quantity of some added remedy, or for a half-way comfortable arrangement of the bed for a sufferer, or any other never so simple aid, and if anything results he is made to feel that it is a great personal favor and no precedent for future occasions. So far as the doctor's side is concerned this does not apply; blood-examinations will be duly carried out, histological quests made, and night-watches kept. But go beyond that—and even your colleagues jeer. All are so accustomed to accept this negative life that they become increasingly dwarfed as medical practitioners. Observation in even the best "medical centers" shows that this evil shadow is very widespread.

For recent Bibliography of this disease see Albany Med. Annals, 1905,

CHRONIC CONSTIPATION IN INFANCY AND CHILDHOOD.[1]

By Robert Hutchison, M.D., F.R.C.P.

Infancy.—Constipation in infancy is much commoner in breast-fed than in bottle-fed children, though in some text-books the reverse is stated. It is difficult to give a reason. In some cases it may be due to some peculiarity in the mother's milk. A deficiency of fat certainly is a cause in some instances. Sometimes it is due not so much to deficiency of any ingredient as to the milk being too watery, with the result that it is absorbed almost completely, so that there is practically no residue to stimulate peristalsis. In favor of that view is the fact that in many cases habitual constipation is accompanied by wasting. Again, there are cases of constipation accompanied by colic, in which the child is more or less restless, draws up his legs, and shows all the signs of spasm in the bowels. On removing the colic the constipation also disappears. These cases may be described as *spasmodic constipation.* Spasmodic constipation seems to be the cause of the colic, which is an obstacle to the passage of the intestinal contents. In another group the cause seems to be defective intestinal secretions. The stools are exceedingly hard, friable, and even chalk-like in appearance. There seems to be a defective secretion of the intestinal glands, and possibly also of the pancreas and liver. Possibly in some cases there is congenital atony or want of power in the wall of the bowel. Constipation in infancy is particularly common and obstinate in children suffering from any form of mental deficiency, particularly cretinism and infantilism. In such cases the administration of thyroid may act almost as a laxative. The writer saw a baby who always had suffered from constipation to an extreme degree, so that a week or 10 days might elapse without a spontaneous motion. He tried all sorts of aperients without success. It occurred to him that the child looked slightly cretinoid, so he gave thyroid with laxatives and the constipation at once disappeared. In these children the complicated nervous mechanism controlling peristalsis seems to be either imperfectly developed or sluggish, just as other nervous mechanisms are interfered with —for instance, that of speech or walking.

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[1] *Clinical Journal,* May 31, 1905.

Consequences.—Wasting is one of the commonest consequences, or, at all events, concomitants. It has been said that in some cases it is due to the poverty of the mother's milk, which causes not only constipation but wasting. It certainly is not always the cause, because not infrequently when after an aperient the bowels begin to act regularly, weight is at once gained, even though there is no alteration in the feeding. Perhaps deficient secretion of the intestinal juices leads to imperfect digestion of the food, or perhaps to imperfect absorption. And when by suitable aperients the intestinal glands are stimulated, digestion and absorption are improved and weight is gained. In some cases the wasting seems to be due to the continual restlessness which the constipation causes. The child is kept constantly uncomfortable, and as the attacks of colic come on he screams and kicks about vigorously. Also he sleeps badly, so that altogether he expends too much energy. This all means a waste of tissue. Habitual constipation causes continual straining, and stress falls on the abdominal wall, One of the most obvious results is hernia, particularly umbilical. Another result is partial prolapse of the rectum. A rarer consequence is dilation of the colon. Finally, there are reflex consequences from stagnation of intestinal contents and irritation of the wall of the gut. Amongst those consequences perhaps the most marked are disturbances of sleep and restlessness, often accompanied by twitching movements, and sometimes culminating in convulsions. On the other hand, babies seem to suffer much less from the toxic consequences of constipation than do older children. This is probably attributable to the fact that their diet consists almost entirely of milk, which produces less intestinal putrefaction than any other food.

Treatment.—In habitual constipation in infancy the treatment must be persistent. Usually the treatment adopted by the mother is anything but this. The child in most cases is allowed to go without a motion for two or three days, and then castor oil or some other drastic aperient is given. This acts at the time, and then the child is allowed to go on again for another 2 or 3 days or perhaps longer, and the treatment is repeated, and so on. Drastic aperients should not be given, but aperients which exert a more or less tonic action on the bowels. The object should be to educate the bowels to act spontaneously. Such aperients as aloes and cascara sagrada are the best, and in many cases one has to fall back upon one or other of these to produce a suitable action. But other plans are often sufficient in the milder cases. In bottle-fed babies, for instance, adding 5 to 10 gr. of phosphate of soda to each feed is often enough to produce an action. Or manna may be given dissolved in hot water and added to the food. Sometimes a grain or so of sulphur given with the baby's milk produces the desired effect. In bottle-fed babies fluid magnesia is often useful. A method largely in vogue in the nursery is the use of soap suppositories or small injections. In some cases the treatment is sufficient when the constipation is due largely to stagnation in the large bowel and defective action in its lower part. But, as most cases are due to a cause operating much higher, this treatment is not to be commended, because it acts upon one section of the bowel only. The habitual use of laxative enemata or suppositories is also apt to result in an irritation of the rectum and chronic catarrh. As an accessory to bringing about a proper and regular action of the bowels, massage should always be adopted. It undoubtedly helps when the constipation depends upon defective muscular tone in the large bowel, and it can easily be carried out by the mother by rubbing the abdomen along the line of the colon systematically for 5 or 10 minutes twice or thrice daily, at the same time kneading the bowel. If necessary a small amount of any unguent or oil may be used to prevent breaking of the skin. It has no other action. In all obstinate cases one or other of the tonic aperients, such as aloes or cascara, must be given. Aloes is best given in the form of the tincture. For a child of 6 months 3-5 m. will be sufficient. With that may be combined other aperients, because in children, as in adults, aperients often act best in combination. One form of aperient acts on the muscles, another on the nerves, and another on the secretions. Which is the actual factor at work in the production of any given case of constipation is not known. Therefore it is better to give agents which will act upon each of these different constituents. For instance, one can give 3 or 4 m. tincture of aloes to stimulate peristalsis and 10 gr. of sulphate of soda to increase secretion. As aloes has a griping action something must be given to prevent that. One of the best drugs is belladonna, about 1 m. of the tincture to the dose. It is always well to give also carminatives, such as syrup of ginger 20 m. and peppermint water to 1 dr. This mixture may be given night and morning, or thrice daily, or oftener. One has to find out what dose is required to produce a daily action, and maintain it for a number of weeks. Then gradually discontinue it and probably the bowels will begin to act spontaneously. Sometimes this combination of aperients is not sufficient, and stronger measures are necessary. Add to each dose 15 or 20 m. of syrup of senna, which acts on the small as well as the large bowel.

Some special indications for the use of drugs may be gathered from the study of the motions. If they are white, chalky, or friable, nothing is so good as podophyllin. It is best given in the form of the tincture, 1 or 2 m. twice or thrice daily. It may either be added to the mixture described, or given alone. If there is much straining and the motions are hard, and passed with much difficulty and tenesmus, the confection of sulphur in half-teaspoonful doses gives good results. It softens the motions in a wonderful way, and children take it well.

Constipation in Later Childhood.—This malady is often the result of the neglect of constipation in infancy, but in some cases it begins after the second dentition. Sometimes it is due to defective diet, which does not contain sufficient things to stimulate peristalsis. The diet is deficient either in bulk, or in articles containing much cellulose, which are specially calculated to stimulate the bowels. But it is easy to exaggerate the importance of the dietetic causes of constipation. There is scarcely any case bad enough to be brought for advice which can be treated effectively by diet alone. Giving bulky things or those which contain stimulating principles will not succeed in the majority of cases. Further, if dieting fails to do good it will do harm, for increasing the bulk of the diet without remedying the constipation throws more work on the bowel, the accumulation becomes greater, and the chances of dilatation and atony are increased. Therefore, if dietetic means do not answer at once, they are likely to do more harm than good if persisted in. There is nothing peculiar in the way in which dietetic means act. They either act mechanically by stimulating peristalsis, or they act, as prunes for instance do, because they contain laxative principles, and it is much easier to regulate a dose of senna than a dose of prunes. Although an alteration in the diet may be advisable in some cases, in more severe cases drugs are necessary. In other cases the habitual constipation is due, as in the adult, to some secretory or muscular fault in the bowel, or to some sluggishness of reflex action, or possibly to a combination of these causes. Which of these causes is at work in a given case cannot be said. One may be led into mistaking an insufficient action of the bowel for a natural action. The mother will say that the bowels act regularly. And so they probably do, but the action is insufficient. In such cases aperients are of great benefit.

Consequences.—The results are more far-reaching than in infancy, because toxic effects are added to reflex ones which are the chief ones in the infant. Older children suffering from constipation are always dull and languid; they suffer from headache and defective appetite, and in particular from disturbed sleep. They are restless and nervous at night, their tempers become affected, and they are depressed, irritable, and peevish. As a result of the retention of the intestinal contents and the production of an excess of mucus by the irritation of the scybala in the bowel the lodgement of worms in the intestine is encouraged; indeed, the treatment of threadworms in most cases consists in giving regular laxatives. A rarer consequence of constipation, which is apt to be overlooked, is *intermittent pyrexia.* There is nothing else obviously wrong with the child, but at night the temperature goes up to 102° or 103°, and that may go on for several nights in succession and then subside. In the cases of 2 little girls there was a history of attacks of pyrexia. For some months all sorts of treatment had been adopted without benefit. The bowels acted regularly. The writer gave aperients and pushed them until there were 2 liquid actions daily, and the pyrexia disappeared. If a child suffers from recurrent attacks of pyrexia without apparent reason it is wise to order aperients and in the majority of cases they will be successful.

Treatment.—First order suitable diet, if necessary, regular exercises, massage of the abdomen, or perhaps abdominal exercises, and sometimes cold douching or sponging of the stomach. In some cases the drinking of larger quantities of fluid is an advantage. Some children do not drink enough water. In certain cases in which the motions are dry merely drinking larger quantities of fluid is sufficient. But in the majority of cases these means alone are not sufficient and, at last, aperients have to be given. The principle laid down for infants applies with greater force; the treatment must be persistent and continuous, and not spasmodic and intermittent. The drugs used should have a tonic effect on the bowel. Here, again, cascara is very useful, preferably as the elixir, or aloes may be given in the form indicated. In some cases a large dose will have to be given, as much as a drachm of sulphate of soda and 15 m. of tincture of aloes, with some syrup of senna, 3 or 4 times daily. Give an increasing dose until there are at least 2 liquid motions daily. Then continue the dose for some weeks and finally gradually diminish it, for the object is to cause a spontaneous action and educate the bowel to perform its function properly. Here, too, sometimes special indications are given by the symptoms. If there is reason to suppose the action of the liver is sluggish—whatever that may mean—when there are depression of spirits, a yellow conjunctiva, and a furred tongue, a so-called hepatic aperient, in addition to the other drugs recommended, gives a good result. One of the best is mercury. It may be given in the form of grey powder at night in addition to the aperients described. If there is much mucus in the motions and worms are present the writer prefers to add rhubarb, 5 to 10 gr. of powdered rhubarb, with 1 or more gr. of grey powder, in the form of a cachet. The rhubarb has a tonic effect on the mucous membrane, or an astringent effect, as some regard it—mucus ceases to be secreted in such a large amount. The worms no longer find lodgment, and they disappear. But rhubarb has not that tonic effect on the muscular coat which belongs to aloes and cascara. It has an astringent aftereffect, for which reason many people object to its continuous use. But in many cases in combination with grey powder it gives better results than anything else. The principle is to select a tonic aperient, and administer it persistently, for weeks or even months. If you are persistent it does not matter much what laxative you give. One child will react better to one and another to another. The great thing is the education of the bowel, and in a child it should always be possible to do that. In the adult that seems almost impossible.

SOCIETY PROCEEDINGS

BETHESDA PEDIATRIC SOCIETY.

Regular Meeting Friday, September 22nd,

At Residence of Dr. B. W. Moore.

Alkalies in Infant Feeding.— Dr. John Zahorsky read this paper. He discussed the problems recently studied in the papers by Kerley and Southworth. It was his custom to modify the quantity of lime-water according to several conditions; the age of the milk, the strength of the proteids and the strength of the fat. Very fresh milk needed no addition of lime-water as far as acidity was concerned. Milk twenty-four hours old needs some alkali.

As alkalies retard the rennet action, the addition of lime-water is indicated in several forms of gastric indigestion. The percentage of alkalies must be proportioned to the strength of the proteids.

Another reason for the use of alkalies is the great tendency to enterogenetic acidosis, whereby needed alkalies are robbed from the system. Especially does this occur when the fat is excessive.

The suggestion of Holt to add one grain of bicarbonate of soda to the ounce of milk is irrational, since it is more than thirteen times as strong an antacid as five per cent. lime-water. Thirty grains of bicarbonate of soda daily acts as a purgative to young infants.

In conclusion, he recommended lime-water as the preferable alkali when a delay of rennet action is desired, but bicarbonate of soda in the proportion of 1 to 3 grains to one pint of milk is preferable in intestinal acidosis or in overcoming simple acid. Magnesia is also very helpful.

New Orthopedic Device.—Dr. Phil. Hoffmann described *a new spinal brace,* that he has recently constructed. The feature of particular importance in this appliance lies in the fact that in cases of vertebral caries in which there is usually a marked tendency for the bodies of the vertebrae to collapse, thus allowing a falling forward of the upper trunk, this is prevented by maintaining an antero-posterior pressure rather than a circumferential pressure as was formally practiced.

Furthermore, the brace can extend very high onto the neck, and can immobilize the head without the use of the unsightly and burdensome "jury-mast."

SCORBUTUS.—Dr. B. W. Moore reported a case of this affection occurring in an infant fed on pasteurized Walker-Gordon milk.

Dr. Zahorsky mentioned a similar case that he had recently seen in a baby that had been receiving malted milk.

Dr. L. M. Warfield described a case of *simple posterior basic meningitis* with autopsy report of brain.

MESENTERIC SARCOMA.—Dr. Carl Fisch related the history of a case occuring in a boy of four years that had been diagnosed as an appendicitis and later as a misplaced kidney by competent surgeons of this city.

PHILADELPHIA PEDIATRIC SOCIETY.

Regular Meeting October 10, 1905.

Dr. McKee in the chair.

The scientific program was opened by Dr. Millicent B. Hopkins who by invitation presented "A Case of Intrauterine Amputation." The boy is from a family of nine children, six of which are living. All except the one presented are normal. The amputation occurred a short distance below the elbow joint. The X-ray shows the bones of the forearm about to protrude through the skin. Dr. Hopkins also showed a "Case of Chorea with Cardiac Lesion." The girl had the diseases of childhood, tonsillitis and pains in the bones. In 1901 it was observed that the child could not keep her feet quiet; peculiar movements of the upper extremities were also observed. The condition became worse when the child was sent to school. When the patient was examined palpitation of the vessels of the neck was observed. The apex of the heart was found to the left of the midclavicular line and at a lower level than normal. The first sound of the heart was accompanied by a murmur which was heard at the apex and was transmitted to the axilla; a presystolic murmur was heard at the apex. The second sound of the heart was accentuated. Dr. Hopkins presented a third case in which a facial palsy followed otitis media. Although an operation was performed in this case the palsy was present before this procedure was instituted.

In discussing these cases Dr. Hammond spoke of three sites where lesion of the seventh nerve may give rise to facial palsy. Sometimes the condition is seen when the lesion is in the nerve after it has passed through the bone canal; at other times the lesions are back of the geniculate ganglion. Catarrhal conditions of the pharynx and nasopharynx may in a way be responsible for this lesion. Dribbling of the saliva is an important symptom in such a condition. When the lesion is centrally placed he notes that the muscles of the eyes are not paralyzed but there is present an additional hemiplegia. If the facial palsy does not clear up soon, he advises operation. Dr. Griffith noted that facial palsy is, according to his experience, seen very frequently in the dispensary practice. In children the Bell's palsy is most commonly caused by the instruments during birth. He has seen one case where the facial palsy was consecutive to otitis media. In discussing the case of intrauterine amputation, he noted that there is usually present some disease of the uterine mucous membrane, and as a result there is, as a rule, present some other defect. He has seen cases in whom the mental faculties were much deranged. While this form of palsy, according to Dr. Harlan's opinion, occurs in children, it is most frequently seen in the adult.

Dr. Arthur van Harlingen then read a short paper on a case of molluscum contagiosum. The condition occurred in a child of four years who had not been in contact with a patient suffering with the disease nor was there another case anywhere near. The lesion first appeared on the ear, then upon the labia majora, later on the arms and legs. Soon the disease appeared in the mother. In the child about twenty-five tumors appeared in various parts of the body. Each growth was covered with a network of blood-vessels. Some time after the mother became affected the girl who took care of the child became diseased. The growths on the mother and on the second patient were not so numerous as on the child. Harlingen treated the growths with nitric acid which caused them to disappear very rapidly. In discussing this paper Ostheimer stated that in the examination of several thousand school children he had met the disease but twice. In closing the discussion, Harlingen noted that the disease was first described about 100 years ago when it was thought to be contagious and was associated with disease of the sebaceous glands. Some time later the contagious feature of the disease was doubted but there is no question at the present time about the contagiousness of the condition. He maintained that rarely are many cases seen at one time and rarely do more than two or three lesions appear. He applied the caustic while the child was asleep.

Dr. Herbert Carpenter showed "A Case of Infantile Scurvy." The child was nine months old. It is the first child born to the mother and weighed 9 pounds at birth; it was breast fed until two months old, when it was placed on the bottle. Because this method of feeding failed to supply proper nourishment the child was placed on condensed milk upon which it did badly. It was then placed upon Mellin's food. The cow's milk was again tried and then a gruel. Two weeks before he saw the patient its legs became swollen, its gums bled easily, there was evidently pain in the ankles and the child would scream when handled. It was constipated. Soon after the patient was placed upon sterilized milk, orange and beef juice the swelling began to disappear, bleeding of the gums ceased and the legs became less painful. Dr. Miller who had seen the case with Dr. Carpenter stated that this was the most marked case he had ever seen. Dr. Griffith believes that in the 40 cases of scurvy which he has seen in consultation the physicians had failed to make the diagnosis. The French authors, owing to the difficulty they have in understanding what our modified milk is, hold it as a commercial article and they believe this form of food is responsible for the frequency of scurvy in this country. He believes the disease is more frequent in France than in this country. In one case he saw, the hemorrhage from the kidney was the first symptom and not until the patient received orange juice was the true nature of the condition recognized. Westcott holds that some children possess a greater susceptibility than others for this disease. When he finds a child fed on peptonized milk he at once becomes suspicious of an attack of scurvy being near. Dr. McKee stated that the first patient suffering with this disease he mistook for a case of multiple sarcoma. In closing the discussion Dr. Carpenter informed the society that in most of the cases which he saw there was a disturbance of the digestion.

Dr. Howard Carpenter showed "Two Cases of Muscular Dystrophy." These two patients were brothers, the one was 8 years old and the other 3½ years. In the older brother the disease was well advanced, while in the other patient it was incipient. The father and the mother of the children are living and well and there is no history of nervousness in the family. When the older patient was 5 years he had an attack of acute bronchitis, when 6 an attack of pneumonia, when 7 scarlet fever and mumps. He has had adenoids removed and has been circumcised twice. The child did not walk until he was 19 months old and did not talk until he was two years old. After the attack of scarlet fever the mother noticed an increase in the size of the muscles of the back and of the calf of the legs. Now the infra- and supra-spinatus and the muscles of the legs are very large, and the biceps muscle of the arms are moderately enlarged; the pectoral muscles are atrophied, the musculature of the hands is weak, and there is present a lumbar lordosis. The tongue is very thick. The left leg measures 29; the left thigh measures 33 cm. and the right measures 33. The left arm measures 16 cm. in circumference and the left forearm measures 16 cm. The younger child had scarlet fever and mumps; he was 3 years old before he began to talk. The boy is dull, talks slowly and appears to be deficient mentally. At the age of one year the child developed a muscular weakness; it was found that he would climb up on his legs in order to assume the upright posture. After he did walk the gait was wabbly. The calf of the legs, the infra- and supra-spinatus muscles became enlarged; the left calf now measures 23 cm., the left thigh measures 30 cm., the right calf measures 21 cm. in circumference while the forearm measures 15½ cm. The arms measure 16½ inches.

In discussing these cases Dr. Hand spoke of one case that he saw and noted that there were five other children in the family but only one was affected. He called attention to the fact that the younger child of the two presented possessed some of the features of the cretinoid condition, although he did not think the child was a cretin by any means. Dr. Griffith spoke of the various forms of muscular atrophy; he noted that in the Erb and the Landouzy and Dejerine types, the atrophy is not preceded by the enlargement of the muscles as occurred in these two cases and he also noted that whether or not the condition is preceded by the apparent hypertrophy, atrophy is always certain to follow.

EDITORIAL

SUGGESTED REMEDIES.

The recent agitation in both America and England in regard to underfed children has been marked in the latter country by the publication of the Report of the Interdepartmental Committee on Physical Deterioration, which not only discusses the lamentable conditions pertaining to the subject, but offers some definite suggestions for their betterment. The conditions discovered are, as is pointed out in a recent number of *Charities,* practically identical with those existing in the large cities of this country, and a glance at the remedies suggested by the English authorities is not without its interest for us also.

The chief causes of the ill-nourished state in which so many children are found seem to be, on both sides of the Atlantic, quite as much the ignorance, and sometimes the carelessness, of the parents as the restrictions of poverty in which they live. Consequently, an effort to remove these causes takes the form of a "campaign of education." Yet while this is in process, and while its ultimate results are being slowly, if progressively, provided for, it is necessary to get at the matter more directly if less fundamentally.

This twofold purpose is evident in the recommendations of the English committee, which are classified under three heads, as follows: 1, provision for children that cannot be reached through their parents by reason of the latters' absolute incapacity or incorrigibility; 2, training of actual parents; 3, training of potential parents.

Under the first head is recommended the establishment of municipal crêches wherever thought advisable because of employment of married women in factories, or for other reasons. The committee further concurs in the opinion of an earlier government commission that "the preparation and cooking of school meals, where it is found necessary to provide them, ought to be regarded as one of the charges incident to school management." The wisest plan, in the opinion of the committee, is for the school authority to supply and organize the machinery, and private philanthropy to furnish the material. Further, children that are especially retarded because of under-nourishment should be placed in special schools where feeding should form an essential feature. In all cases the parents should be made to feel responsible and held to account for the proper support of their children, to the end that the community "may be protected from the somewhat dangerous doctrines that free meals are the necessary concomitant of free education."

Under the second heading they advise the general issue to mothers of leaflets on the care of children, and under the third the establishment of continuation classes for domestic instruction at which the attendance of girls who have left school shall be made obligatory twice a week during certain months of the year. "The courses of instruction at such classes should cover every branch of domestic hygiene, including the preparation of food, the practice of household cleanliness, the tendance and feeding of young children, the proper requirements of a family as to clothing—everything, in short, that would equip a young girl for the duties of a housewife "—rather a large order, one cannot help thinking, for two lessons a week, but it naturally depicts the ideal toward which to strive rather than a result actually contemplated. The committee adds: "There is no reason why a judicious discretion should not be permitted in the enforcement of compulsory attendance at such classes. Girls in domestic service, for example, might properly be exempt, as comfortable homes are as a rule found among the working classes where the wives have had the benefit of such training; factory operatives, on the other hand, are said to make the worst wives, and to facilitate their attendance at such classes some modification of the hours of work might be introduced."

Mrs. Parsons, writing in *Charities,* approves the general trend of English recommendations, and would advocate the establishment of self-supporting school restaurants in the vicinity of schools, where a hot and nourishing dinner could be obtained at the lowest possible cost, such restaurants to be entirely dissociated from "charity." By means of a ticket system, however, the children of temporarily destitute parents could obtain free meals without the knowledge of either the restaurant manager or the other children. The tickets could be managed by settlements, relief agencies or school nurses. The second item as suggested by the committee, Mrs. Parsons would enlarge by the use of the school kitchens in the late afternoon or evening for cooking classes for the mothers. The continuation classes she thinks a valuable suggestion, and believes that the "indispensable object lesson in such classes, *i.e.*, the baby, the bedroom or the kitchen," might be provided by "coöperation with private associations, hospitals, nurseries, settlements, etc." An extension and development of the functions of the school nurse is also an essential factor in the plan which she advocates.

WORD BLINDNESS.

In discussing word blindness and its treatment in a recent issue of the *Lancet,* Charles Wray draws an interesting and practical distinction between true word blindness and what he terms "pseudo word blindness." In the former the patient is unable to recognize words that are in his vocabulary, in the latter he fails to recognize words because they are not in his vocabulary, which in some cases is extremely restricted. Such cases are best treated by placing the child in classes where he will hear a maximum of talking, reading and word building, to the end that the limited vocabulary may be increased, and the defective ear memory which always complicates pseudo word blindness may be trained to more effective service. The difficulties which beset a child afflicted with pseudo word blindness may be estimated if we note the difference in the process which occurs when a normal child reads a new word and when the pseudo word blind reads it. For instance, when the normal child sees the word "frog" in print for the first time, and pronounces it as his training in word building enables him to do, he at once associates the appearance of the word with the spoken word which is already familiar, and also with the animal itself. The pseudo word blind child, on the contrary, does not associate the printed word either with a sound familiar or with any object.

Naturally, where the vocabulary is defective, spontaneous speech must suffer, and all the more because phrases, those "memorized permutations of words," which are the common coin of conversation, are also lacking, and the child suffers from restricted phraseology as well as from a defective vocabulary. As a consequence he feels himself at a disadvantage among other children and tends to avoid them and shut himself up in himself, a course which naturally aggravates the very condition which occasions it.

Obviously, it is both useless and cruel to put such a child in a reading class until his vocabulary and phraseology have been trained up to a point approximating the normal. This must be done by "filling his mind with intelligent speech." To this end the cooperation of the child's parents should be enlisted, and the nature of his defect and its proper treatment carefully explained to them. When sufficient improvement has been secured to enable the child to go into the reading class without losing confidence, he should go over beforehand what he is to read, checking the words which he has to spell out, and then go over these repeatedly again, removed from their context by means of an "isolator," a disc with an oblong opening in it.

By patiently following out these methods, a child may be brought up to normal standards, who, by a little misunderstanding and neglect could easily have been relegated to the ranks of the distinctly defective.

True word blindness the author believes to be excessively rare, and the keynote to its treatment is repetition, the isolator proving of service also in this variety of the affliction.

ABSTRACTS

Infantile Atrophy.—A. H. Wentworth, Boston (Journal A. M. A., August 26), notes the frequency of this condition and the theories of its causation, reviewing at some length the leading literature on the subject. He concludes that there are no gross or histologic changes in the intestines or liver in infantile atrophy, except the possible presence of Paneth's granules. From the total of the evidence he thinks it safe to assume that this condition is a functional digestive impairment, without definitely stating what particular functions are involved. He reviews the facts as regards the parts played by different kinds of food, and states that in his experience the best treatment is the return to the natural food of the infant —breast milk. These infants, he says, are just as able to gain in weight as any normal infant when they receive a suitable food. In such cases, therefore, he states his views to the parents, and advises a wet nurse. Even a few weeks of this diet will, in many cases, so improve conditions that the child can be returned to modified cow's milk diet, if this should be considered desirable.

Primary Tuberculous Tumors of the Peritoneum (Perlsucht).—A. Uffenheimer (Münch. med. Woch., July 18, p. 1397).—Tuberculous tumors are comparatively infrequent. They may occur in the larynx, and occasionally in the nose, as circumscribed pediculated tumors, closely resembling carcinoma or fibroma. Tuberculous tumor-like masses may also occur in the lymphatic glands, heart, pleura, intestines, and muscles. Cerebral tuberculosis and tuberculous hepatic nodules are transitional forms. Closely related to, though not to be confounded with these tuberculous tumors, is the form of tuberculosis which resembles the disease of cattle, known in Germany as *Perlsucht*. According to Troje, this is extremely rare in man. Ipsen, of Copenhagen, could find only 3 published cases. The following case was typical of *Perlsucht,* and was also of interest in that infection was evidently of intestinal origin.

A child, aged 1 year, was seen on Feb. 4. He was well developed, though pasty and somewhat rickety and suffering from extreme meteorism and obstinate constipation. Congenital dilatation of the colon was diagnosed, but no improvement followed treatment directed to this condition. On Mar. 3 he was admitted to hospital. The father suffered from some pulmonary trouble. Of five brothers and sisters one had pulmonary tuberculosis. For

5 weeks the child was fed with sterilized cow's milk. Afterwards, cow's milk from the same cow, and always previously boiled, was given. A short time before admission an abscess formed on the left index finger, and 2 days before slight otorrhea occurred.

The weight was 7,800 gm. There were slightly enlarged lymphatic glands in the left axilla. The epiphyses were enlarged, and there was a rickety-rosary. The abdomen was distended, but there was no dulness, and nothing but scybala could be felt. On the metacarpal bone of the left index finger a sinus led down to bare bone. The feces were always hard unless castor oil had been given. On Mar. 20 over 1 kilogm. in weight had been lost. On April 5 symptoms of tuberculous meningitis appeared, and on April 9 death occurred.

Necropsy.—There was extreme emaciation. Scattered over the skin were a number of discharging abscesses. The omentum was firmly adherent to the parietal peritoneum at the umbilicus. To the left the adhesions were not extensive, but in the right side of the abdomen the intestines and omentum were so firmly adherent to the parietal peritoneum that their removal was difficult. The small intestine was distended and covered in its entire length with roundish, flattened nodules, varying in size from a millet seed to a pea. They were of the consistence of marrow, of a grayish color, and occasionally were pigmented in the center. In places several nodes had coalesced to form larger tumors. Several of the larger nodes were surrounded by a hyperemic areola. The parietal peritoneum was thickened. Some nodules were also present in the omentum. The spleen was enlarged, and contained a few gray miliary tubercles. The liver was slightly enlarged. On the surface were a number of small nodules, and in its interior miliary tubercles. The mesenteric glands were greatly enlarged, and in places caseous. The nodules on the intestines were situated between the submucosa and the serous coat, and could be easily dissected off the intestine with the peritoneum. Some of the nodules were only loosely connected by more or less long fibrous cords with the intestine, and were freely movable within the peritoneal cavity. Here and there such pseudo-ligaments containing small nodules were stretched between the intestine and other organs. The intestinal mucosa was normal. Round the larger nodules were usually a number of gray, subserous, miliary tubercles.

In the upper lobes of both lungs were emphysematous vesicles, which, on incision, were found to be of the size of peas, and lined with small caseous nodules. Both lower lobes were hepatised, and contained a number of gray, miliary tubercles, which were also present on the pleura. The bronchi contained purulent fluid. But the bronchial, tracheal, and cervical glands were but slightly enlarged, and contained no trace of tubercle. The skull was large, and the anterior fontanelle was not completely closed. There was typical tuberculous meningitis. The *Perlsucht* nodules consited of a necrotic center, in which were tubercle bacilli. This was surrounded by cellular fibrous tissue, which contained a few giant cells, and more externally by a small-celled infiltration. The nodules which closely lined the emphysematous vesicles in the lungs had a caseous center with numbers of tubercle bacilli, which was surrounded by a fibrous layer, and again by a small-celled infiltration. The nodules in the capsule of the spleen and liver consisted almost entirely of fibrous tissue. The gray nodules had the structure of ordinary miliary tubercles. Except for these, which had evidently arisen through the circulation shortly before death, the usual appearances of human tuberculosis were absent.

Evidently the mesenteric glands were first infected, and the *Perlsucht* infection of the peritoneum followed. The pulmonary affection was of hematogenous origin, as the bronchial glands were intact. That the pulmonary nodules were of this origin was also indicated by their structural resemblance to those of the peritoneum. The milk had always been boiled, and the writer concludes that the source of infection was the father. Some authorities hold that human *Perlsucht* represents only one form of chronic attenuated tuberculosis. That it is common in cattle is due to the fact that they exert a specific, attenuating action on tubercle bacilli. Troje and Tangl triturated highly virulent human tubercle bacilli with iodoform and injected rabbits with the mixture. The resulting tuberculosis was in the form of *Perlsucht,* though normally rabbits react differently to human and bovine tubercle bacilli.

Congenital Dislocation of the Hip.—P. W. Willis (Journal A. M. A., August 26) first notes the objections to the Lorenz manipulative technic and results, following practically the lines laid down by Royal Whitman and Jackson Clarke. It consists in stretching the muscles on the internal, anterior and posterior aspects of the joint until sufficient relaxation for reduction is produced. This is usually accomplished when the trochanter can be drawn down to Nélaton's line. Reduction is attempted by forced abduction of the thigh, which is at the same time completely flexed on the abdomen and rotated inward. After reduction the anterior fibers of the capsule are stretched and the plaster cast applied. Only in a very easy case, however, would the operation be completed at one time, and the usual plan is to use a moderate amount of manipulation and to make a few gentle attempts at reduction, and then to put the hip in a cast in the position of abduction. After two or three weeks the cast is removed and another attempt at reduction is made. The abductors will now be found well relaxed, and the manipulations mainly required on the posterior and anterior muscles. The same method is repeated again, and if after three or four such attempts reduction fails, it is undoubtedly wise to resort to the open incision. When reduction has been secured, the cast is changed about once in two months, or oftener if much soiled or broken, a radiograph is taken, and the hip is gently moved in different ways, avoiding adduction. On account of the risk of relapse, treatment in the cast is continued for at least a year after final reduction, even in favorable cases. Three cases of children are reported with five hips reduced, one of them by the open method, with three perfect anatomic results. The permanent functional results will only be known after months or years. This method of repeated gentle manipulations has the merit of little danger, and the patient is better prepared for the open method if that is found necessary.

"Infantile Paralysis"—Its Nature and Treatment.—Dr. Albert E. Sterne, of Indianapolis (Lancet Clinic), says "Infantile paralysis" is, as its name would signifiy, mainly an affection of the early years of life. Properly designated it is "poliomyelitis anterior acuta," a disease of the cells in the gray anterior horns of the cord. While the malady is not frequently met with among adults or older boys and girls, it is by no means, as is commonly supposed, wholly confined to childhood. Typical cases have been reported in persons over twenty years of age, but not one, so far as is known to him, in a patient over thirty-five. By "infantile paralysis" is meant only that form of palsy among children which is of spinal type and origin. The cerebral palsies should never be so designated. The name is, perhaps, not wisely chosen, inasmuch as it lacks definiteness, but it has become so well received by the medical profession that it will probably remain in our nomenclature. Poliomyelitis is essentially an infectious disease, and is regarded by some authors as the purest form of a true nerve-tissue process. It occurs sporadically in all localities and at all seasons, but several endemic outbreaks have been reported, one of eighty cases near Rutland, Vt., among persons living in a valley. Naturally, where many cases occur about the same time and place, the malady is easily recognized. In fact, it is so in almost all instances after typical development has taken effect. In the very earliest stages of the disease, however, the diagnosis is very difficult, almost impossible, before evidence of spinal involvement is shown.

When the child first becomes ill almost all symptoms point to an affection of the stomach. There is commonly much nausea and vomitus, and the parents and physician are apt to consider the case one merely of acute gastric disturbance. This it is perfectly natural to do, inasmuch as not only the symptoms, but the age of the victim, indicate such a condition. This state may last but a few hours, or, more usually, a couple of days, before paralysis sets in. Yet he has repeatedly observed that the child is more profoundly ill in this possibly premonitory stage, than in those cases in which a purely gastric condition is evident. There is more general involvement of the nervous system as a whole, there is apt to be more tendency to coma and delirium, while the vomiting savors of the nervous, expulsive type. Whenever he sees such a condition it is his custom to draw the attention of physician and family to the possibility of an on-coming poliomyelitis, and in not a few instances has this developed. More than one physician has drawn upon himself the condemnation of the family and friends by pronouncing the illness trivial, a mere "spoiled stomach," and finding the little patient partially or wholly paralyzed at his next visit. Whenever, therefore, we find evidences of profound nervous involvement associated with vomiting, especially if the latter be expulsive in character, it should serve as a diagnostic and prognostic warning. The paralysis is usually sudden in its onset, occurring most frequently after a day or two of illness. Not unusually it is first noted in the morning after a comparatively restful night—possibly a slightly comatose period. The paralysis is apt to be widespread at first, with a distinct tendency toward regeneration of the paralyzed members, until only those parts or groups of muscles remain functionless which become more or less permanently affected. Thus, in a case in which one or both legs, or all members together had been paralyzed for a few hours or even days, there sets in a hopeful ability to use the affected members, save only one group of muscles, most frequently the extensors of the foot, and there the regenerative tendency ceases. Now, it is during this period—the paralytic—that he feels called upon to say the greatest error in judgment and treatment is made, to the permanent damage and disability of the little sufferer. It is his belief that many children now passing through life in a crippled condition as the result of poliomyelitis might have been spared their affliction had more vigorous and appropriate measures been taken during the regenerative period. The great trouble has been that physicians feared to inaugurate early mechanical measures at a time when the patient may have seemed critically ill. Experience has taught the author otherwise, and it is for this reason that he has been impelled to speak upon this subject, which rightly belongs to the domain of general medicine. He does not believe that there is the slightest ground for fear that too active measures might be employed. Quite the contrary. Delay under such circumstances seems to him wholly inexcusable, particularly the long period of waiting in the hope that the regenerative tendency may continue to complete restoration of the lost motor functions. From hundreds of cases of this disease we should learn the lesson that there remains, almost invariably, a total loss of power in some group or groups of muscles, and that "waiting to see" is absolutely inexcusable. The author realizes perfectly that this is forceful language, but where year after year he finds small children brought to him with the same old story, and finds them absolutely paralyzed in certain regions beyond any hope of recovery, it seems justifiable to speak vigorously. In the beginning stages of this affection we are dealing probably not with any local stomachic lesion, but with a general systemic infection, which unfolds its action mainly upon the cells of gray matter in the anterior (motor) horns of the spinal cord. It is possible that a similar, but less severe, effect is manifested in analogous centres farther up the spinal axis, even in the brain, but, so far as he knows no case of nuclear involvement in the medulla has ever been reported. The characteristic vomitus, present in almost all cases of true poliomyelitis, seems to him to be due either to the general constitutional infection or to the involvement of the centres controlling the motor activity of the stomach. The pathologic process in the very first instance is not, as is usually supposed, intrinsic in the nerve cells, but in their vascular supply. In those cases which succumb in the early stages of the disease we find evidence of an inflammatory process starting from the small blood-vessels among the cells of the anterior horns, rather than in the cells themselves (Siemerling). In other words, we are confronted with the problem of a deep-seated inflammation in the spinal cord itself, a region not easy to reach by any means at our command. However, we can and should use those we possess, such as counter-irritation along the spine, antiphlogistic applications and the constant use of *dry cold* to the vertebral column. Perfect rest must be maintained. Internally, as no specific is known to us, we are forced to employ systemic remedies, such as quinine and the salicylates in some form, and, moreover, to use them to the limit of tolerance. If the stomach, as is rather frequently the case, refuses to retain anything, either or both of these drugs may be rubbed into the skin. He has found the pure salicylate of methyl especially valuable and quinine acts not only as a constitutional germicide and antitoxin, but it also raises the inhibitory power of the motor spinal centers. Naturally, every effort must be made to control the vomiting. Ingluvin is often effective, and pure tincture of iodine in minute doses of from one-quarter drop to five drops, properly diluted, has rendered me valuable service here, as in other forms of obstinate vomiting. In one instance, a lad of four years, the stomach-tube, washing with cold water, acted like a charm. In spite of every effort, fatal cases occur, usually early in the course of the malady. After paralysis has set in we must understand that the nerve cells have themselves become the seat of the inflammatory process. Degeneration does not take place in the acute inflammatory stage, but follows rapidly enough if this be long continued.

As soon as possible after the palsy becomes manifest he advocates the employment of electric stimulation of the paralyzed members, preferably by nutritive currents of high frequency with the massage roller, but any form of battery will answer the purpose in the early stages of palsy, before nerve cell degeneration has occurred. After this is in play and the reaction of degeneration is shown in tested muscles it is too late to await much from any form of electric current.

It must be understood that he is speaking of the acute attack itself, not of the after effects. Unfortunately, the neurologist sees these cases long after the acute illness has run its course, usually months and sometimes years afterwards, and then he is expected to work wonders with his high-tension, high-frequency coils. Then it is too late, and for this reason he exhorts general practitioners to employ active measures early in the affection. True it is that by persistent efforts and many months of constant painstaking treatment decided good may be accomplished even in the late cases, either through the above-mentioned agencies or by surgical tendon transplantation. But these measures are at best poor substitutes for the vigorous early ones herein advocated. Time and again he has witnessed the almost perfect recovery of these little patients where active measures were taken during or immediately after the acute attack. Results can then be attained which are incomparably superior to the very best gained by any method whatever later on. He makes a plea—a vigorous plea—for such early interference. Every general practitioner can use them, and if he cannot, let him call in some one who can and will. By so doing he is saving the very future of his patient, who, otherwise, at the very best, must pass through life with a palsied, atrophic arm or leg, for not alone do the paralyzed muscles remain backward in their development, but the entire affected portion of the limb suffers in its nutrition, with the result that what should have been a useful portion of the body becomes merely a flaccid, flail-like appendage, not infrequently secondarily dislocated in its joints.

Interfere and interfere early and we shall see fewer victims of "infantile paralysis."

Post-Diphtheritic Paralysis—A Report on Two Cases.—Aubrey T. Mussen, Assistant Clinical Neurologist at the Montreal Hospital reported these cases. *Case I.*—F. B., aged 27.—Patient has always been a healthy man. Three years ago he used alcohol to excess, but has not indulged since. On August 16th, 1904, he developed diphtheria, and was in the Civic Hospital up to September 16th, 1904. He was treated with anti-toxin from the onset. During his stay in the hospital he had paralysis of palate, but only slightly, and had quite recovered when he returned home in September. He then went to work, but after two days, he noticed that his speech became indistinct, and that he had difficulty in swallowing. On September 18th, 1904, he called in his physician, who kept him in bed six weeks. His speech and power of swallowing improved greatly. But he began to notice subjective sensations, numbness, and tingling in the hands and feet. When he got up his legs were so weak that he could hardly walk. He thought this was due to remaining in bed, so he went out for a little exercise. When he returned he was much weaker, and could hardly get up stairs. The weakness steadily progressed in the legs. Then the arms became involved, and then the back. At this time—November 25th, 1904—he began to attend the Neurological Out-Door clinic and showed the following signs: The gait was distinctly ataxic, the legs being moved as if heavy and limp, somewhat resembling the steppage gait of spastic paraplegia—Rhomberg's sign was present. He was so weak that he could hardly get up on the table for examination. Plantar, Achilles', knee-jerks, and cremasterics, were absent. Abdominal, epigastric and reflexes of upper extremities were present and normal. Pupils were equal and gave reaction to light, but not to accommodation. There was marked weakness in flexors of ankles, and extensors of toes; also in the extensors and flexors of the leg and thigh. The right leg throughout was weaker than the left. In the arm the flexors and extensors of forearm were very weak; he could not flex or extend forearm against the resistance of one finger. The dynamometer showed the left grip 32; right 30. The right side was weaker than the left, showing the paralysis to be hemiplegic in character. Sensation to touch, pain, heat and cold were diminished to a great extent on the soles of the feet; but less so on the dorsum. Sensation in limbs was above the normal. In the upper extremities there was no objective sensory disturbance. Subjectively, there was numbness in the legs from the knee downwards. The hands were also numb, but there was no loss of the steriognostic sense. The sense of position of the toes was lost, and of the limbs uncertain. The sense of position of the fingers was normal. Electrical examination showed good response in the muscles of the arm, but there was a mild reaction of degeneration present in the legs.

December 20th, 1904. The patient is much improved. From a recumbent position he can rise to a sitting posture without help. The strength of the limbs is greatly improved, and he can go up and down stairs with ease. The arms and hands are much stronger; dynamometer, right 80, left 110. Objective sensation is normal but there is still numbness in hands and feet. Reflexes, same as before. Electrical examination, the same. January, 1905.— Condition steadily improving. February, 1905. Motor power in limbs about normal. He can easily step up into a chair. There is no Rhomberg sign. Dynamometer, right 90; left 110. Sensation is normal. Reflexes and sense of position of toes normal. There is good faradic response in all the muscles. Patient was discharged in the 10th week, having made a complete recovery.

Case II.—B. B., aged 30. Patient had always been a healthy man up to January 3rd, 1905, when he developed diphtheria. He was treated with anti-toxin from the beginning. The disease lasted one month. For 18 days he was confined to his bed. Food regurgitated on one occasion only. He remained in the house, after leaving his bed for 28 days. After this, as he felt quite well, he resumed work, and continued for three weeks. During this time he began to notice soreness of the throat and difficulty in swallowing. A little later he found that he could not read, although his sight for distant objects was good. Shortly after this he began to experience numbness in his extremities, associated with weakness; and he came to the Neurological Outdoor clinic on March 3, 1905. Patient then walked with a shuffling gait, due to the weakness and incoordination. Rhomberg's sign was well marked. There was marked weakness in extremities, but not so severe as in Case I. Dynamometer showed R. 65; L. 70. Plantar absent, knee-jerk (all the others) present. Pupils equal; react to light, but not to accommodation. In hands and feet sensation diminished, though not lost—otherwise the sensation is normal. Steriognostic sense absent in hands; subjectively feet and hands numb. Electrical examination showed fair response in muscles of arms, but a slight degeneration in muscle of right leg. Through March and April his condition gradually improved. The power of accommodation was much better. Legs and arms stronger. Dynamometer, R. 86; L. 90. In May, strength of limbs was much improved, but right not quite as strong as the left. The plantar reflex is still absent. Other reflexes are normal. Faradic irritability in the leg only slightly diminished. In the arm normal. No objective sensory disturbance. Subjectively, the numbness is confined to soles of feet and to ulnar side of hands. There is now no loss of steriognostic sense. The patient was discharged May 25, 1905, having completely recovered. Before discussing treatment he reviews these two cases. Each one illustrates the usual onset and progressive character of post-diphtheritic paralysis. Beginning with the primary involvement of the palate which, as a rule, does not occur until the disease is over. Generally in the second or third week we see the spreading nature of the poison demonstrated in the loss of power of accommodation. Thence, gradually progressing numbness is felt in the lower extremities, followed by weakness and a loss of myotatic irritability was evinced by loss of the knee-jerk. Then the upper extremities were affected. If these cases had been left untreated, the palsy might have still further proceeded, involving the muscles of the trunk and neck, disturbing the heart, and possibly, as in some severe cases, involving the bladder and rectum.

Treatment:—This was given twice a week and lasted for 15-30 minutes. It consisted of galvanism to keep up the tone of the muscles, and later, when the nerves had regenerated, of Faradism. Vibra-massage was also given. This treatment is administered by means of an oscillator, which, in the opinion of many, is an improvement on the Chattanooga vibrator. By this means vibra-massage is administered throughout the entire body, back, abdomen and limbs. The result is a stimulating effect on the circulation, producing a pleasant sense of warmth. The muscles and nerves are nourished, and peristalsis of the bowels is increased, these helping to avoid the obstinate constipation that is apt to follow in these cases. In general it produces a tonic effect throughout the whole system.

Unilateral Syringomyelia in a Child.—L. H. Herbert of Indianapolis (Indiana Med. Jour., Sept., 1905) reports an interesting case of unilateral syringomyelia in a child 5 years of age. C. G., with healthy parents, and not suffering from known nervous taint. Child was well up to Aug., 1898. There then appeared a painless panaritium of the third right toe with separation of phalange later. A similar process took place in the fourth and fifth right toes with loss of the end phalanges. Two months ago the second toe became afflicted and a similar condition ensued.

The child, which has always run about barefooted, never exhibited pain, despite the serious and long lasting panaritium and bone necrosis.

Status praesens.—June, 1900, a 5-year-old patient, well built and well nourished for her age. Sensorium free. A face not without intelligence. Internal organs normal. Urine negative. Pupils of equal size, reacting promptly to light and accommodation. No changes in the action of the muscles of the eyes. Fundus of eyes normal. Tongue is projected in the median line without quiver; not atrophied.

No disturbance to be noted in the function of the cranial nerves. The spinal column shows in the dorsal region a slight right-sided scoliosis. No pain to be evinced along the spinous processes. The gait in walking is not altogether certain. The patient easily falls to the right side. Romberg's symptom absent. No rectal or bladder disturbances. Mobility in general normal. The right calf is smaller than the left; the electrical reaction is unchanged.

No pain elicited on pressure upon the nerves of the part. The examination of the sensibility shows the following: The face, the entire trunk, the upper extremities, the left lower extremity, and the right thigh react normally to the sensations of touch, pain and temperature. On the contrary, the right leg particularly the right foot, can be demonstrated to exhibit marked disturbances of sensibility, greatest in the toes and decreasing gradually to the knee. These changes are most pronounced in the stumps of the affected toes. Deep needle pricks are felt only in a tactile sense. On the dorsum and sole of the foot exists a somewhat lessened analgesia and thermo-anesthesia. The right leg manifests the least dissociation anesthesia. Stereognostic and location sense are preserved. Sense of pressure in the foot is lessened. Muscular sense for position and passive motion exists. Right patella reflex and right plantar reflex absent as well as the achilles reflex. Normal abdominal reflex. Trophic changes.—The toes of the right foot, with the exception of the great toe, are greatly mutilated, the little toe entirely lacking.

Here is found complete analgesia, thermo-anasthesia and a slight disturbance in the tactile sense. The last phalanges of the third and fourth toes are wanting, the toes exhibiting conical stumps. The second toe is in the last stage of necrosis; this toe is club-shaped on the end of which is a small, shallow ulcer, with red, painless granulations; a probe passed into the ulcer encounters roughened necrotic bone. The skin of this toe and the neighborhood is purplish, thickened, shiny and covered with more or less warty excrescences. The bones of the entire right foot are thickened and larger than the left. There is difference of over one centimeter in the circumference. The circumference of the right leg and knee joint is one centimeter greater than the left. We see, therefore, in this case a slight atrophy of the calf muscles of the right side, pronounced dissociation anesthesia in the right foot, slight disturbance of the tactile sense in the toes of the same side, slighter dissociation anesthesia in the leg, grave trophic changes as panaritium, necrosis of the phalanges, enlargement of the bones (pseudo-acromegalia), changes in the skin and absence of the skin and patella reflexes.

Having found in this case all the main symptoms of syringomyelia such as dissociation anesthesia, trophic changes and muscular atrophies, which, however, were not pronounced, there scarcely can remain a doubt as to the diagnosis, since we are in the position to exclude other nervous diseases which in many respects may be taken for syringomyelia.

In leprosy, which can present a similar picture to that of syringomyelia the dissociation anesthesia is rare and the disturbance of sensibility exists in localized areas only. In this case there is absent the characteristic skin changes in leprosy as tubercles, ulcerations, etc. The great similarity which exists between syringomyelia and leprosy in their clinical aspects is shown in an interesting observation made by Nicholas Senn, of Chicago, who demonstrated by photograph a case of leprosy in a child with bone necrosis in the same locality. (Notes of Travel, Journal A. M. A., 1904.) In endeavoring to localize the position of this gliosis in the spinal cord, both as to its vertical and transverse extent, we must refer to the scheme of Edinger and Allen Starr.

Thus in relating the symptom complex with such a scheme, we may assume that the cavity formation in the cord can be placed in the lumbo-sacral region, extending from the second lumbar to the fifth sacral segment.

Insomuch as the process is a unilateral one, we can further assume that the cavity exists in the left gray matter of the lumbosacral portion, since, by anatomical and physiological researches the tracts for pain and temperature are shown to decussate in the spinal cord.

From the small amount of muscular atrophy as compared with the extensive trophic and sensory changes, we conclude that the left anterior horns are in very slight degree affected, while the posterior horns indicate grave changes; that is, if we rely upon the present physiological opinion that the tracts for the transmission of sensations of pain, heat, the trophic and secretory functions of the skin, and the deeper tissues, bones, etc., lie in the cord region and in the posterior horns of the cord.

Since we have in our case tabetic symptoms, such as absence of the patella and plantar reflexes, lessened tactual sensibility, we must conclude that the process has involved in slight degree the posterior columns (of Gall and Burdach) as well.

As we know, Morvan described a symptom complex, consisting of painless panaritium (whitlow's) atrophies of the upper extremities, dissociation anesthesia and lessening of tactile sensibility.

The consensus of opinion, however, of the more recent authorities denies the pathological entity of Morvan's disease and considers it rather as one of the many forms of syringomyelia—type of Morvan. Since, in my case, Morvan's symptom complex is shown in the lower extremity, even though unilateral, I feel justified in doubting that Morvan had seen such cases with the localization of the lesion in the lumbo-sacral region of the cord, because he would not have limited the disease to the upper extremities alone. My case is, therefore, a further clinical proof that Morvan's disease is but a form of syringomyelia and marks in this respect a small contribution to the further clinical aspect of this disease.

School Hygiene.—ALICE M. SMITH, Tacoma Wash. (Journal A. M. A., September 30), advocates an elaborate national, state and local system of boards of school hygiene and preventive medicine. . The national board composed of representative nonpartisan physicians with the commissioners of education and of public health as ex-officio members, should have a general advisory and supervisory function. It should make investigations on school hygiene and publish results, be an authority on school construction and furnish plans, superintend the civil service examination of all medical men connected with school inspection and supervision, have charge of examination of school janitors and should publish circulars and bulletins of information. The state board should supervise the location and construction of school buildings, should help the national board to frame laws, should promote proper legislation, supervise the physicians holding office under the system, should have power to close insanitary schools, decide as to the management of incorrigible children, and be the final repository of all statistics and records. The local board should supplement the state board; it should be composed of non-partisan business men and physicians, with the municipal health officer ex officio. It should keep the records of the scholars during school age, and exercise such functions as ordinarily belong to the school boards of the municipality that are not otherwise provided for. All these boards should be federated so as to have complete unity of action. She would also have the principal of a public school a graduate physician, looking after every matter concerning the health and welfare of the scholars. He should have systematic methods of entrance examinations, including family history and heredity, physical measurements and condition, etc. There should also be a county medical superintendent acting for the rural schools, and the system outlined by Dr. Smith also includes social organizations for the education of parents, distribution of pamphlets of instructions, industrial homes for the incorrigible, etc. Such a system, if carried out, she thinks would go far to prevent epidemics, to decrease crime and to develop the mental, moral and physical condition of the community. It would put physicians in their proper professional relations to society and open up a wide field of usefulness to an overcrowded profession.

Central Ataxia in Childhood.—A. W. FAIRBANKS, Boston (Journal A. M. A., October 7), discusses the condition occasionally observed in children characterized by muscular inco-ordination, delayed voluntary muscular action, unsteady gait, slow or hesitating speech, occasionally explosive, nystagmus, tremor, involuntary movements, choreiform or otherwise, deficient energy and later paralysis, muscular spasm and contractures. Other less characteristic symptoms are vertigo, headache, optic atrophy, pupillary anomalies, various mental and sensory symptoms, trophic changes in muscles and more rarely, sphincter weakness and cutaneous trophic changes. Some of these symptoms are later than the others, and may mask the earlier symptoms of the disease. Fairbanks thinks tendon reflex anomalies are simply a matter of duration or extent of the central lesion and not essential to the symptom complex. The variations from the original type of Fredreich are remarked, and the author refers to the cases reported by Everett Smith, Nonné, Menzel and Sanger Brown as most typical and interesting of the type here discussed. In the autopsies that have been made nearly all the subjects showed extreme degeneration of the posterior parts of the cord and the posterior nerve roots were more or less degenerated in all. In all but one case there was some atrophy of the medulla and cerebellum and atrophic changes in certain of the cranial nerves. The pathology of the condition is discussed, and he points out that the latest formed portions of the cord are the seat of greatest degeneration. He thinks that the defects indicate a process supervening on a developmental insufficiency, either of structure or inherent vitality of the nervous system. In Nonné's anomalous case there was general smallness of the entire nervous system without special sign of degeneration.

Cessation of Epilepsy after Removal of Adenoids.—St. Clair Thomson, M.D., F.R.C.P., F.R.C.S. (Practitioner, May, p. 1).—In the Summer of 1898 a child, aged 6, was sent to the writer by Dr. Ferrier, with the following note: "She is under my care for *petit mal*, but she is getting deaf, and there are signs of some throat affection—probably adenoids. I am sure the epilepsy will also be benefited by the removal of this discomfort." She had been subject to fits from the age of 4. Two attacks of *petit mal* occurred during her visit to the writer, within twenty minutes. During these the head was thrown back, the eyes turned up, the upper eyelids twitched, and inspiration was shallow and noisy. Each attack lasted only a few seconds, and the patient recovered consciousness without falling from the chair. She was said to have caught cold a month or two previously, and had since been deaf and a mouth-breather. She was also reported to be restless in bed, talking in her sleep and throwing off the clothes. There was no enuresis. The child had a well-marked adenoid facies. She was a constant mouth-breather, the root of the nose was very broad; and the inner folds of each upper eye-lid, which by some is thought to be accentuated with adenoids, was well marked. She was said to have a dry nose, and anteriorly the nostrils appeared normal. The molar teeth had not fallen, but the palate appeared a little arched. She was so deaf that whispered speech was heard only at 2 yards. The membranae tympani were very translucent, only slightly retracted, and the pink injection of the inner tympanic wall was easily visible, shining through the drum membrane. In children this appearance is characteristic of Eustachian and middle-ear catarrh from adenoids, and, with digital examination, these growths were found to be plentiful. There were no palatine tonsils. A large mass of adenoids was removed on Aug. 25, 1898. On Sept. 7 the patient had ceased to be a mouth-breather, the membranae tympani no longer were pink, and she heard a whisper at 4 yards. She was reported to sleep quietly and to be much brighter, but the fits still continued. In Mar., 1902, the parents reported that the fits had ceased within a few months of the operation, and had not recurred. She was a bright, intelligent girl of 12, weighing 6 stone 8 lb.—*i.e* 16 lb. above the average. She was no longer a mouth-breather and had no trace of adenoids, and her hearing was perfect. There was no marked arching of the hard palate. For a few months after the operation she took bromide. She is now nearly 13 and has had no fits for 7 years. In other cases in which the writer has removed adenoids the result has not been so satisfactory. But the most unsatisfactory cases of epilepsy are those which begin before the age of 10.

Two Relapses of Pneumonia in a Child.—H. AUDEOUD (Rev. Med. de la Suisse Romande, May 20, p. 359).—Relapse of pneumonia is not rare in children, even in the same lobe of the lung, though more frequently another portion is involved. Double relapses are less frequent. Comby records the case of a boy, aged 5, who had 3 attacks of penumonia of the right apex in the course of a month. A similar case has been observed by the writer.

A healthy boy, aged 10, was seized with pain in the left side which was followed by dulness, crepitations, and tubular breathing at the left base. The temperature varied from 101.5 to 104.5 (Fig.), and the attack was severe and complicated by suppurative otitis and extensive prostration. Delirium persisted for 7 days and was accompanied by hallucinations, especially of vision, and refusal of food and drink. However, strength was well maintained and the pulse did not exceed 120 or the respirations 60. The crisis occurred on the sixth day, the temperature falling from 104.2° to 100.7°, then to 95° without symptoms of collapse. It was immediately followed by a return of appetite. The physical signs improved and coarse crepitations were noted on the ninth day.

On the morning of the fourteenth day, after 6 days of apyrexia, slight friction was heard, and in the evening there was a return of pain in the side with elevation of temperature and signs of another attack of pneumonia at the left base. This period of pyrexia lasted 6 days showing a gradual rise from 95° to 104.7° in 12 days. During this attack there was no delirium but there was a transient scarlatiniform erythema on the trunk and limbs. The temperature returned to normal on the eighth day with rapid disappearance of the pulmonary signs.

After an interval of 9 days, and 30 days after the beginning of the illness, pain recurred in the side, the base of the left lung again being involved. The temperature rose to 102.7° but the symptoms rapidly subsided and the patient was discharged after an illness lasting 42 days. Contrary to the usual experience the attacks of pneumonia were of decreasing gravity.

BOOK REVIEWS

A TREATISE ON THE NERVOUS DISEASES OF CHILDREN FOR PHYSICIANS AND STUDENTS. BY B. SACHS, M.D., Alienist and Neurologist to Bellevue Hospital, Neurologist to the Mt. Sinai Hospital, etc. Second Edition. William Wood and Company, New York.

Dr. Sachs gave the American physicians almost the first work on nervous disorders of children—certainly the first authoritative and complete treatise that could be utilized by the practitioner.

We welcome his second edition. In it may be seen the great advances that neurology has made in the past few years since the appearance of his first edition.

While it cannot be said that his book has been rewritten, and in places we feel that he would have preferred to discard many plate pages, not that the facts presented are less patent today than when they were written, but the view point has so profoundly altered, that in their old setting they seem not to be the facts of yesterday, the revision, however, has been fairly thorough and the profession will find here an authoritative and valuable work.

SUPERSTITION IN MEDICINE. BY PROF. DR. HUGO MAGNUS. Translated by Dr. Julius L. Salinger. Funk and Wagnalls Company, New York and London.

This is a very fascinating and interesting essay. Dr. Magnus has wrought long in the field covered by this short book and it is a pleasure to get it in English dress as well cut and in mode as Dr. Salinger has given it.

This is a book that should be read by all physicians. Many of us are still nursing superstitions—the uric acid diathesis—the lithemic dyscrasiae—the diabetic habit—the hysterical predisposition—the 'entity of a disease—these and many more modern hypotheses are eagerly championed by hobbyists and taken over in simple faith by the non-discriminate.

A review of human frailties, as found in this work, is worth while seeing, since it enables one to make a better adjustment to present day faiths.

CARBONIC ACID IN MEDICINE. BY ACHILLES ROSE, M.D. Funk and Wagnalls Company, New York and London.

It is a pleasant thing to ride a hobby—in fact certain of us cannot be happy unless we have one—but when the hobby is a good one, the enthusiasm is not altogether unwarranted.

After a brief introduction on the physiology of carbonic acid formation and a historical summary of legendary and marvellous cures the author takes up the history of some of the chemists whose discoveries led up to the accurate appreciation of the structure of this substance.

He then discusses at length the therapeutic uses of the gas, all very interestingly, but to us at times with an optimism that is not tempered by the critical factor.

Dr. Rose's well-known views on the subject of misocainia, however, would tend to permit an optimistic belief in, one might say, everything, since he has shown that disbelief has seemed to be the rule in affairs of this kind.

He has given us a thing of shreds and pieces, a patch work of quotation, fact and fancy, that withal is interesting and perhaps worth while.

MANUAL OF THE DISEASES OF THE EYE FOR STUDENTS AND PRACTITIONERS. By CHARLES H. MAY, M.D. Fourth Edition Revised. William Wood and Company, New York.

Dr. May's book is not a new one—but the present revision makes it practically new, for every page has been carefully revised, and the already high quality of the illustrative work has been enhanced by a number of new and excellent illustrations.

This handbook has had the rare fortune of a German, an Italian and a British Edition, but it is a distinction founded on superior merit. Above all, the work has the quality of available practicality, of simplicity and compactness. In the admiration of these excellent qualities the *sine qua non* of authority is to be included.

We do not wonder that, as the imprint page tells us, it has had four editions in as many years, many of which editions have been reprinted, for, combined with the thorough value of this book to students and practitioners, the excellent work of the publishers has contributed much to its ready success.

We know of no small manual as valuable to the average man as this one.

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PEDIATRICS

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ORIGINAL ARTICLES

REPORT OF CASES OF INFANTS FED ON COW'S MILK WITH THE ADDITION OF CITRATE OF SODA.*

By J. W. Vanderslice, M.D., of Chicago.

INSTRUCTOR IN PEDIATRICS, RUSH MEDICAL COLLEGE.

I report to-night twenty cases of infant feeding by the addition of citrate of soda to cow's milk, plain and diluted. This method of feeding is that used by Dr. F. J. Poynton of London. With him I followed its use during last year, and have used it almost exclusively during this year, both in private and dispensary practice. The use of citrate of soda as a modifier of cow's milk for use in the dietary of infants was originated by Prof. A. E. Wright, who published in the Lancet a communication entitled "The Possible Advantages of Employing Decalcified Milk in the Feeding of Infants and Invalids. Previous to this, Arthus and Pages had demonstrated that when cow's milk was treated by oxalates or fluorides it did not curd with rennet because of the precipitation of the lime salts; but if, on the other hand, lime salts were added to the milk, the clot formed by rennet was denser than usual. Prof. Wright applied this principle to the question of infant feeding, pointing out that the oxalates and fluorides were poisonous salts, and suggested the use of citrate of soda.

As cow's milk contains an excess of lime salts as compared to human milk, it can afford a precipitation of some of its lime salts without any effect on the nutrition of the infant. We do not in any way undervalue the necessity of these salts to the economy of the growing child, but simply precipitate a part of them by the use of an amount of citrate that will insure a uniformity of growth in the child.

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*Read at the October meeting of the Chicago Pediatric Society.

Experience has taught us that a good working formula is one grain of sodium citrate to each ounce of milk. The milk used is plain or diluted. Beginning in a child six months of age or under, a solution of one part each milk and water is used, increasing the proportion of milk as rapidly as the child shows ability to digest it.

The following are twenty consecutive cases treated in the Children's Clinic, Rush Medical College:

Case I.—Child, aged five months. Breast-fed two months, then with diluted cow's milk and breast. Child restless and irritable. Eructations of gas frequent. Bowel movements green, watery and of a very foul odor. Abdomen distended and tympanitic. Typical facies senilis. Temperature 102 deg. Weight 7 pounds. Diagnosis: Marasmus. Treatment: Calomel, gr. 1-10 each hour for six doses. Diet: Gruel and water only for 24 hours, then beginning milk and water aa ℥i, with one grain sodium citrate. There was a general constant improvement. In the first ten days there was a net gain of one pound.

Case II.—Child, aged six weeks. Diet, cow's milk, diluted. Bowel movements green, watery, foul and sometimes streaked with blood; colic; vomits white curds after feeding. Is being fed two to three ounces every two hours. Treatment: After routine initial treatment for the first twenty-four hours the patient was put on milk and water aa ℥i, sodium citrate gr. ii. Vomiting ceased. Bowel movements, two to three a day, yellow, not watery. Child is hungry, and quantity increased to milk ℥iiss, water ℥iss, citrate of soda gr. v. Net weight gain in thirteen days, two pounds.

Case III.—Child, aged four months. Breast-fed. Child has lost weight past two months. No diarrhea or vomiting. Weight 7 pounds 12 ounces. Mother's milk analysis shows: Fat, 4; albumin, 1.5; sugar, 6.5. Treatment: Child was taken from the breast and put on milk ℥ii, water ℥i, sodium citrate gr. ii. Third day: Child improved, facies better, less restless. Tenth day: Improvement: weight 8 pounds 5 ounces. Bowel movements hard and pasty. In this case constipation developed, but it was the only case in which we found any such tendency. Dr. Poynton found this a rather constant accompaniment, but I believe that is so in his cases because of the poor quality of milk commonly sold to the London poor. Prof. Wright does not report any difficulty of this kind in his cases.

Case IV.—Child, aged five months. Diet, malted milk. For past week child has refused all food. Mother brings her for advice as to what to feed child. Bowel movements normal. Weight 8½ pounds. Treatment, milk and water aa ℨii, sodium citrate gr. ii, every three hours. Fourth day, improved. Thirty-second day, weight 11 pounds.

Case V.—Child, aged ten months, bottle-fed with modified, certified milk. Weight at birth, 8 pounds; present weight 13¾ pounds. Bowel movement yellow, frequent and pasty. Treatment: Milk and water aa ℨviii, sodium citrate gr. viii. Increase in weight was immediate and constant, making a gain of 6 to 12 ounces each week. At the end of first month patient was taking whole milk with citrate gr. 1 to the ounce. By the end of the second month of feeding child was taken off citrate of soda, using it after this only at times of special stress.

Case VI.—New-born infant put on milk and water aa ℨi, with sodium citrate gr. i; quantity and percentage was gradually increased. At four months of age baby is taking milk ℨiv, water ℨiss, sodium citrate gr. iv. The growth and development in this child is apparently normal; weight 14 pounds.

Case VII.—Child, aged ten months. Weight at birth 6½ pounds. Has been persistently constipated. Weight gain slow. Child breast-fed 8½ months; since then has been given white of an egg morning and evening, with two feedings of cow's milk between. Present illness, diarrhea and vomiting. Status presens, extreme malnutrition; weight 11 pounds. Treatment: Calomel, gr 1-10. every hour for 6 hours. Diet: Milk and water aa ℨiv, sodium citrate gr. iv. Third day, improved, no temperature, weight same. Seventh day temperature 104°, diarrhea, weight 11 lbs. 4 ounces. Diet changed to milk and water aa ℨiv, sodium citrate gr viii. Tenth day, improved; weight 11½ pounds. Seventeenth day, improved; weight 12 pounds. Diet increased to milk ℨvi, water ℨiii, sodium citrate gr. iv. Twenty-fourth day, improved.

Case VIII.—Child, aged seven months. Breast-fed until three days ago; now given cow's milk. Present illness, diarrhea, with vomiting. Treatment, castor oil ℥ss, followed by colonic flushing. Diet, water only allowed for twenty-four hours, then given milk and water aa ℥iv, sodium gr. iv. Third day, improved, no vomiting, bowel movements four to five a day, good color and odor. Seventh day, improved, and bowel movements three to four a day. Diet increased to milk ℥vi, water ℥iii, sodium citrate gr. vi. Tenth day, improved.

Case IX.—Child, aged eleven months. Breast-fed ten months, with the addition of boiled milk to diet since five months of age. Present illness: Weaned one month ago, put on diet of whole boiled milk. Past two weeks had diarrhea, ten to twelve bowel movements in twenty-four hours, green, foul, watery. Treatment: Calomel gr. 1-6 every hour for 6 hours; colonic flush with starch water. Diet, gruel water for 24 hours, then milk ℥ii, sodii citrate gr. ii, every 4 hours. Third day, improved; diet increased to milk ℥iv; only one bowel movement in past 12 hours. To-day improved. Diet increased to milk ℥vi, sodium citrate gr. vi. Fourteenth day, improved.

Case X.—Child, aged four months. Breast-fed six weeks, then given condensed milk. Child has diarrhea and vomiting; twelve bowel movements yesterday, green, watery, foul. Treatment: Routine treatment first 24 hours; then milk and water aa ℥ii, sodii citrate gr. ii. Third day, improved; no vomiting. Seventh day, improved.

Case XI.—Child, aged nine months. Breast-fed four months, then put on proprietary foods, all of which she has tried. Weight 8 pounds at birth. Was a plump, strong child, weighing, it is said, 14 pounds at four months. Since then the weight has been about stationary until one month ago, when she developed a severe gastro enteritis, with a rapid loss of weight. Physical examination: Child has four teeth. Markedly apathetic. Rachitic rosary. Enlargement of ends of all long bones. Emaciation extreme, weight 7 pounds. Temperature 97.2°. Treatment: Stopped all food for 24 hours, artificial heat applied. Bowels flushed with normal salt solution every 6 hours. After first 24 hours was given rice water and white of one egg a day for two days. Then milk and water aa ℥i, sodium citrate gr., 1, two feedings a day, were added. The number of feedings was slowly increased and at end of two weeks diet was milk ℥ii, water ℥ii, sodium citrate gr. ii. There was no loss of body weight during this two weeks. After this there was a distinct gain in weight each week. The amount of milk was increased as rapidly as child could digest it. At the end of first month's treatment the diet was milk ℥iv, water ℥ii, sodium citrate gr. iv. At the sixth week: Milk ℥vi, water ℥ii, sodium citrate gr. vi.

Case XII.—Child aged five months. Diet proprietary food, condensed milk, etc. Weight at birth 7½ pounds. Bowel movements constipated, light colored, hard. Status presens: Extremely emaciated, apathetic, skin dry and cool and hangs in folds on limbs. Temperature 97.8°, weight 6½ pounds. Treatment: Calomel, gr. 1-10, ipecac, gr. 1-16, bicarbonate of soda gr. ½, one to be taken every 6 hours. Colonic flush normal salt solution twice a day. Diet: Milk and water aa ℥i, sodium citrate gr. i, every 3 hours, with albumin water ad lib. Third day, improved and weight same. Tenth day: Improved, weight same. Increased diet to milk ℥ii, water ℥ii, sodium citrate gr. ii. Eleventh day: Improved, weight 6¾ pounds. Increased diet to milk ℥iii, water ℥ii, sodium citrate gr. iii. Twenty-fourth day: Improved, weight 7¼ pounds. Bowel movements normal in frequency and color. Thirty-first day: Improved, weight 7¾ pounds. Diet increased to milk ℥iv, water ℥ii, sodium citrate gr. iv, every three hours. This was an early summer case and the child did not have an attack of acute indigestion during the hot weather but made rather a constant growth.

Case XIII.—Child aged six months. Diet, modified milk. A week ago child developed an acute diarrhea with rapid loss of weight. Bowel movements 10 to 12 a day, green, watery and very offensive. Treatment: Initial treatment of calomel, gr. 1-10 every hour for six doses, colonic flush of normal salt solution twice a day. Diet of albumin water for 48 hours. Then patient was given two feedings in the third 24 hours, of milk ℥ii, water ℥ii, sodium citrate gr. ii, which was well borne. Fourth day: Four feedings of same mixture alternating with gruel water. Fifth day: Milk ℥iii, water ℥iii, sodium citrate gr. iii every three hours. Bowel movements, three in 24 hours. Tenth day: Diet, milk ℥iv, water ℥ii, sodium citrate gr. iv. Seventeenth day: Patient reached her weight of one month ago. Discharged as recovered.

Case XIV.—Child aged fourteen months. Diet, Mellin's food. This child has never been able to digest cow's milk, diluted or plain and was put on milk ℥vi, water ℥vi, sodium citrate gr. xii, one feeding a day, this with varying success for about two weeks, changing the quantity and the strength with only partial success. Patient was then taken to summer home and regular feedings given of the milk solution, giving only two ounces of the mixture with each feeding. The amount of milk mixture was gradually increased and at end of eighth week patient was taking whole milk with sodium citrate gr. i to each ounce of milk.

Case XV.—Adult who had never been able to digest cow's milk. She was given milk with the addition of citrate of soda and was able to take it without any discomfort.

Case XVI.—Child aged eight months. Breast-fed. Was weaned in early summer and put on milk ℥vi, water ℥iii, sodium citrate gr. vi.

Case XVII.—Child aged ten months. Breast-fed. Weaned to cow's milk ℥vi, water ℥iii, sodium citrate gr. vi.

Case XVIII.—Child aged three months. Breast-fed, weaned and put on milk ℥ii, water ℥i, sodium citrate gr. ii.

Case XIX.—Child aged five months. Breast-fed and supplementary diet of cow's milk ℥iv, water ℥ii, sodium citrate gr. iv, two to three feedings each day.

Case XX.—Child aged three months. Breast feeding, supplementary diet of milk ℥ii, water ℥v, sodium citrate gr. ii; ad lib after each breast feeding.

All the above patients were brought for medical attention. They were sick when first seen. In our treatment of these cases we have used our regular treatment for the existing condition and have first directed our attention to the dyspepsia, in most of these cases stopping all milk for a period of one day to one week, not giving the citrate of soda milk before we would have given any other milk formula.

All patients who came to our clinic during the past summer suffering with digestive disorders and being fed artificially were put on this diet of citrate of soda milk. After the use of this diet for one year we are ready to report it as the most satisfactory and successful method of artificial infant feeding that we have ever used. In our experience every child would take and could digest milk when modified in this way. All of the patients under our observation and weighed from week to week showed a more than usual rate of growth, and, in so far as we were able to detect, a perfectly normal development. In the younger children showing one or more signs of acute rachitis these soon disappeared when the children were put upon this diet. The experience of Dr. Poynton that in many cases constipation developed was not ours and I believe that it is the quality of milk used rather than the citrate which is the cause of this symptom. We do not place this addition to our infant's dietary as a cure-all nor claim that it is the only method of feeding children, but we are firmly convinced that it is a great addition to our armamentarium and that especially in dispensary practice it is certainly far in advance of any other diet as a routine dietary. Our guides in the use of citrates are first the body weight. This is taken each week while the child is undressed. Second, the mother's report as to the condition of the child. Third, the appearance of child.

One rule as to the amount of citrate is if the indigestion persists, increase the citrate even though the weight shows a good body growth, remembering that our milk dyspepsia may be caused by other ingredients than the proteids and that the citrate deals only with the curd. We do not stop the citrate but use considerable patience in discovering what other cause may be at fault. A common experience has been that of having mothers who have had the children on the citrate and have not had it for some time come and ask for more of the medicine to put in the milk as baby is vomiting again. The advantages of this method of feeding are: It renders the curd of cow's milk finer and more easily digested. It is cheap. It is convenient and easily administered. It allows of giving milk more concentrated with no danger of under feeding. It is given as a medicine, gaining the confidence of the mother, and whatever her mental condition may be she is usually capable of putting one teaspoonful of the medicine in each feeding, so that we can use this citrate of soda milk in cases where it is impossible even to suspect the mother of being capable of modifying milk.

On account of the ready solubility of the citrate of soda we prescribe as many grains to the dram as we are giving ounces of milk to the child, then giving a mixture containing enough for one week's feeding. For example, an infant that is taking milk ℥iv, water ℥ii, sodii citras gr. iv, six feedings each 24 hours, is given a prescription for

℞ Sodium Citrate .... gr. ʒiii
Chloroform water .... m x
Aquae dist. .... ℥vi

Med. sig.: One teaspoonful to be put into each feeding.

We have found that there was a possibility of a fungoid growth as there is in dilute bromide solution if the chloroform water is not added. In offering this method of milk modification as an addition to our infant dietary we but ask a fair and impartial trial. The milk as treated should be given to the child at a time when the digestive tract is in a fairly good condition. It is not to be expected that this simple addition to milk will cure all milk dyspepsias but we do believe that any child in which the milk dyspepsia has been alleviated is capable of digesting this citrate of soda milk and that it will correct many of the cases of indigestion that are constantly coming under the observation of the medical profession.

"SCHOOL" LATERAL CURVATURE*

By Henry O. Feiss, M.D., Cleveland

The spine is a flexible column divided into three curves: the highest or cervical is a convex curve forward, the next, the thoracic, is concave forward, and the lowest is like the lumbar, convex forward. These curves are to be regarded as the effect of balancing. They are attained by shifting the trunk into antero-posterior equilibrium and are maintained chiefly by muscular action.

In early infancy this muscular activity is not present and the child is not able to sit up, but as he grows, voluntary power comes into the muscles and the child learns to sit and finally to stand up. Later the whole action of balancing and maintaining the curves of the spine becomes an involuntary one.

By lateral curvature we understand a constant deviation of the spinal column or any part of it from the median line of the body. It is an asymmetry which is constant. There are various types classified according to their predisposing causes. We have the congenital type which is rare, the rachitic type due to rickets, the paralytic type arising from paralysis of muscles on one side or the other, the static type which is due to inequality of the legs, that type which follows diseases, and of the greatest importance—the type due to occupation.

It is the occupation type that comes under our present notice. We have seen that the normal curves of the spine are maintained as a result of balancing. The maintenance of these normal curves may serve as an analogy of the maintenance of abnormal curves. The spine being flexible it is capable of assuming many asymmetrical positions which are normal if they are not habitual. If, for example, on account of same particular occupation, any person maintains his spine steadily in an asymmetrical position, he will become used to that position and while doing his work will naturally assume this usual position as the easiest. This is not a so-called "habitual" asymmetry unless he takes that position naturally even when he is not at his occupation. However, if the curve is not naturally obliterated when his work is over, it may be that the person may resume the straight position by simply reminding himself to do it. Such a curve comes under the head of a flexible curve. If the curve cannot be straightened out without using undue force, we have a fixed curve. The longer a person has assumed an habitual curve, the more likely it is to be fixed. It is under the head of the occupation type that we must consider "school" scoliosis.

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* Presented at a gathering of teachers of Psysical Education of the Cleveland Public Schools, 1905.

Dr. Truslow,[1] of New York, found that in 400 cases of ocucpation scolioses, the following occupations were represented: School 285, factory 19, clerk 13, domestic 8, millinery and dressmaking 8, messenger 3, teacher 2, no occupation 59; making a total of 400.

Bradford and Lovett[2] made observations upon 67 healthy males who were taking an examination. At the end of two hours their attitudes were noted. In all cases there was a slight rotation of the spinal column. The authors assumed, therefore, that if a twist of the spinal column occurs in writing among strong men, faulty attitude must be extremely common in children.

In the last few years there has been considerable discussion as to whether a school scoliosis actually exists. The result of this discussion shows conclusively that the school does produce a great proportion of lateral curvature. The question has recently been investigated by Dr. Scholder[3] [4] of Lausanne, who says that school scoliosis is that more or less fixed and consolidated oblique position of the trunk which is attained by habit, and which is maintained by changes in the bones and ligaments. The faulty position of school children which, in its beginning, is physiological, gradually becomes pathological as the position becomes habitual. He further states that the reason why certain physicians have not recognized school scoliosis is because they have only come in contact with such fully developed stages as would naturally appear in orthopedic institutes and hospitals, such as the rachitic and the paralytic types. These physicians, however, base their statistics on their own experience, not recognizing the fact that enormous numbers of children supposed to be well-formed, but who are not necessarily so, have not come under their notice. Therefore, he thinks the proper way to look into the question is to examine the children in school and to see how many are really scoliotic. He examined 2314 school children and found 571, or 24.67%, of these had lateral curvature. To be sure, the great majority of these did not show any marked degree but there certainly was this marked percentage of deformity.

As to the frequency of the scoliosis in the two sexes, he found them equally divided. This differs from the statistics in orthopedic institutions in which, figuring on nine different sets of statistics, the result was 85.8% scoliosis in girls and 14.2% in boys. The reason this is mentioned is to show that the statistics in orthopedic institutions differ from those based on school children. Krug in Dresden found results similar to Scholder in Lausanne.

In Scholder's 571 cases he found the great majority had a left curve and Krug's statistics show about the same. Scholder believes this tendency to a left sided lateral curvature is alone a sufficient argument that school is a determining factor in the formation of scoliosis, for such a lateral curvature corresponds to the faulty attitude usually assumed by children in sitting.

The author we have quoted gives another set of statistics for the separate classes, and found practically a steadily increasing percentage of scoliosis. This again is an argument that there is a "school" scoliosis for it shows that the children who have been longest in school have the greatest percentage of lateral curvature.

7th	class,	218	children,	19	cases of	scoliosis—	8.7%,	myopia in	3. %
6th	"	257	"	47	"	"	18.2%,	"	4.5%
5th	"	408	"	81	"	"	19.8%,	"	5.2%
4th	"	404	"	110	"	"	27.2%,	"	6. %
3rd	"	370	"	105	"	"	28.3%,	"	8.5%
2nd	"	354	"	115	"	"	32.4%,	"	19.4%
1st	"	304	"	94	"	"	31.%,	"	19.4%

This table shows besides the percentage of increase in scoliosis, a similar increase in myopia.

Kilburn[5, 6] of Boston has also reported on the causative relation between scoliosis and eye-strain.

Scholder shows how his statistics compare with those of other men in other towns.

Guillaume in Neuchatel, 713 school children, 218 cases of scoliosis—29%
Krug in Dresden, 1,418 school children, 357 cases of scoliosis—25%
Haggmann in Moscow, 1,664 girls 29%
Kallbach in Petersburg, 2,333 girls 26%
Scholder-Weith-Combe, Lausanne, 2,314 children, 571 cases of scoliosis 23.67%

The conclusion that Scholder drew was that one-fourth of the school children were scoliotic and he designates as the type of school scoliosis an "habitual" form with a left curve.

In considering the treatment of school scoliosis we must recognize the cause, for it is by the prevention that we get the best results. We find two chief causes: First, prolonged attitude, and, second, faulty attitude. The latter may be due, first, to faulty furniture; second, to faulty inclination of the copy-book, and, third, to faulty obliquity of writing. There are other causes of which we may mention faulty lighting. In prolonged attitude the danger is that the tired child wishes to shift its position whether it is a good one or a bad one. The muscles relax and the whole spine collapses into any one of the vast number of faulty positions. It gradually becomes used to one position which we may call the habitual one. The child only gets out of this habitual faulty position when reminded to do so. The point is that we must avoid tiring the child by prolonged attitude. We may do this perhaps by letting the child take a few muscular exercises at various intervals or by any other means which are practical.

As to faulty attitude due to faulty furniture this may be due either to incorrect designing of the individual furniture or to a disproportion between desk and chair. The question of school furniture[7] is a difficult problem because it is so hard to say exactly what furniture is the most suitable. In this matter we ought to be guided more by common sense than anything else. The desk should be large enough, of the right height, according to the size of the student, and not too much inclined. The chair should be comfortable. The distance between the desk and the chair is of relatively great importance. It should not be too great, or the head must be bent too far forward which would tend to round shoulders. Scholder thinks that the back rim of the desk should be perpendicular with the front border of the chair seat.

The question of the position of the copy-book is of some importance for if the copy-book is very oblique, the head must be turned, which means a curve in the spine. This would imply, moreover, that one eye would be nearer to the book than the other.

It is doubtful whether this position of the copy-book is of great importance but to be on the safe side it would seem, according to concensus of opinion, that the copy-book should be vertical. Then the question comes up as to the obliquity of the writing. Should the oblique style be advocated? Of course if the copy-book is to be vertical the writing must be vertical. Logically this would seem to be the only correct position. The quality of the hand writing from that position ought not to enter into the question, since it is the favorable position for keeping the child straight and for keeping the eyes at equal distance from the book.

On the question of school scoliosis Hoffa[8] writes as follows: "The most important part of the treatment of lateral curvature consists in the prophylaxis." He advocates limitation of the number of school hours, simplification of the teaching program, reduction in the amount of home work, regular methodical gymnastic work with a view to the increased mobility of thespinal column and the strengthening of the muscles, especially those of the spine. Further when we recognize that scoliosis is acquired through incorrect posture disease, then the hygiene of school seating becomes an especial point in the prophylaxis. ,

Schultess[9] of Zurich takes the following point of view: He says that when we refer to a school scoliosis we mean a left convex total scoliosis and lumbar scoliosis of girls. In the other forms of scoliosis the school is not to be recognized as the chief cause. His theory is that the spine of the child, which is naturally prone to bend to the left, is given the opportunity to assume the attitude and to maintain it for some time on account of writing. For children which are prone to the other types of curves, it is the prolonged sitting position which does the harm. The student sits as he has grown and faulty curves are maintained. As to remedy he advocates measures similar to Hoffa's,, (vertical writing).

Lorenz[10,11] writing in 1889, says that he believes the extreme work of prolonged sitting is a more important point in the prevention than faulty furniture.

The conclusion that we may draw from all the foregoing is that there is such a thing as a school lateral curvature. Whether it is a left lateral curve or a curve of another variety is of relatively little importance, the point being that the school is a predisposing cause to deformity.

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CLINICAL OBSERVATIONS ON DIPHTHERITIC PARALYSIS.

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HISTORICAL.

(*Continued from page 701.*)

RELATION OF AGE TO PARALYSIS.

Upon this subject the opinions of various observers differ. Though all are agreed that the greatest incidence of diphtheria is upon the young, the same unanimity does not prevail as to the relative frequency of the subsequent paralysis at different ages.

Trousseau records several instances of paralysis in adults, but says that it is most commonly found in children's hospitals. Osler, on the other hand, says it is proportionately less frequent in children than in adults. Caiger is of opinion that paralysis affects young children more often than older patients. The same view is held by Woollacott, who points out how liable paralysis is to escape notice when it occurs at an early age.

My own figures show that it is uncommon below 3, that more than half the cases occur between 3 and 6, and that it is fairly frequent up to the age of 16. Among 46 patients between the ages of 16 and 29, I did not meet with a single case, though

TABLE VI.

Age and Sex of 500 Patients.

Age	0—5	5—10	10—15	15—29	29—50
Male	88	82	33	17	7
Female	62	133	35	35	8
Total	150	215	68	52	15

Total—Males 227
Females 273

Age and Sex in 115 Cases of Paralysis.

Age	0—5	5—10	10—15	15—29	29—50
Male	28	17	11	1	1
Female	16	34	7	0	0
Total	44 = 29.3%	51 = 23.7%	18 = 26.46%	1 = 1.9%	1 = 6.6%

Total—Males 58
Females 57

RELATION OF AGE TO PARALYSIS.

Age.	Total No. of Patients.	Paralysis Cases.	Percentage.	Severe Paralysis Cases.	Percentage.
0-1	7	1	14.0	0	.0
1-2	18	4	22.0	0	.0
2-3	31	3	9.6	0	.0
3-4	42	17	40.4	4	9.5
4-5	52	21	40.4	10	19.2
5-6	68	21	30.8	7	10.2
6-7	58	11	18.9	3	5.1
7-8	37	8	21.6	2	5.4
8-19	24	3	12.9	1	4.1
9-10	28	6	21.4	3	10.7
10-11	25	6	24.0	2	8.0
11-12	15	4	16.6	3	20.0
12-13	11	2	18.1	1	9.9
13-14	9	4	44.4	1	9.9
14-15	8	2	25.0	2	25.0
15-16 16-29	52	1	20.0	1	19.2
29-30	4	1	25.0	1	25.0
30-35	11	0	0	0	.0
—	500	115	—	41	—

of these, 2 suffered from very severe, 4 from severe, and 4 from moderately severe attacks. The patient, aged 29, an ambulatory case, suffered from one of the most extensive and persistent palsies I have seen. Of the remaining 11 patients one had a severe, one a moderately severe, 4 moderate, 3 mild, and 2 very mild attacks; but none of these had any form of paralysis whatsoever.

So unvarying has the experience at the Grove Hospital been with regard to the relative immunity of adults from paralysis, that, whereas children are detained, whatever the character of their attack, till the 42nd day of their disease, adults are discharged by the end of the 4th week, provided in each case the general condition is satisfactory, that no form of palsy is present, and that the nature of the primary attack has not been of such severity as to lead one to anticipate paralytic sequelæ at a later date.

How large a percentage of patients develop paralysis after discharge is an interesting subject for enquiry. Herringham[29] says that he has found many out-patients with paralysis who have been discharged from hospital as cured. In the absence of more definite evidence the comparatively long period of detention of patients at the Grove Hospital (*v.* Table IV.)

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[29] Allbutt's System of Med., Vol. 1

makes it more than probable that the number of patients discharged from this hospital as cured who subsequently develop paralysis is very small indeed.

Not only in my experience is paralysis more common in children, but the severer forms are more frequently seen in them than in adults. Here again the explanation of the difference of opinion is to be found in the fact that many adults neglect a sore throat, and that there are more ambulatory forms among adults than in children. Hence the former are more liable to be found in private practice, in general hospitals, or in hospitals for nervous diseases than in fever hospitals.

RELATION OF PARALYSIS TO ANTITOXIN.

Perhaps the question of greatest interest to-day is the relation of paralysis to antitoxin-treatment. On this subject anything but unanimity prevails. M. Marfan[30] of the Hôpital des Enfants Malades at Paris, where over a thousand young diphtheria-patients are treated annually, is of opinion that since the introduction of the anti-diphtheritic serum paralysis has become much less frequent. The value of this statement is, however, considerably discounted when it is known that in the French capital, owing to lack of accommodation, diphtheria patients are only kept during the acute stage; indeed, the children may be taken home even before the throat is clean if the parents insist. Early affection of the heart and palate are thus the only palsies likely to be met with.

MM. Weill and Deguy[31] distinguish two kinds of paralysis: the first including paralysis of the palate and larynx, which they admit is still very frequent, but according to them is less due to diphtheritic intoxication than to local inflammation. The second group includes paralysis of the limbs, eyes and viscera, which is due to the action of the diphtheria-toxin and is much less frequently met with since the introduction of antitoxin. M. Variot[32] in his excellent work dismisses the subject in a footnote by saying that paralyses are not rarer after serum-treatment than before, but present the same localization, the same clinical characters and the same duration as before.

The most satisfactory answer is given by the statistics published annually by the Metropolitan Asylums Board. The yearly admissions to its fever hospitals of diphtheria patients is considerable, and each case is, as a rule, kept long enough for paralysis to develop.

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[30] Clinique Infantile, May 15, 1904.

[31] Traitement de la Diphtérie, 1902.

[32] La Diphtérie et la Serumthérapie, 1898.

TABLE VII.

Annual Admissions and Percentage of Paralysis Cases among Diphtheria Patients in Metropolitan Asylums Board Hospitals.

Year.	No. admitted.	Percentage of Paralysis Cases.
1893	2,848	14.2 (Pre-antitoxin year).
1894	3,666	13.1 (only a few cases injected).
1895	3,635	20.4 (general employment of antitoxin).
1896	4,508	20.5
1897	5,637	20.55
1898	6,566	19.42
1899	7,066	20.0
1900	7,195	18.50
1901	6,926	15.0
1902	6,534	17.07

As will be seen from Table VII. the percentage of paralysis during the years following the introduction of antitoxin is remarkably higher than in 1894 and 1893. There is, as was pointed out in 1895 by the Medical Superintendents of these hospitals, more than one explanation of this. In the first place, cases that before would have died in the acute stage now survive, and suffer those palsies which before were found only in the less severe cases. Secondly, the new treatment roused fresh interest in diphtheria, and stimulated more careful clinical observation.

TABLE VIII.

Relation of Paralysis to Day of Disease on which Antitoxin was given.

1st day	1	5.5	0	.0
2nd day	16	15.09	4	3.7
3d day	28	18.7	8	5.3
4th day	27	28.7	12	12.7
5th day	21	35.0	5	8.3
6th day	15	34.9	10	23.2
7th day	4	19.4	1	4.7
9th day	1	50.0	0	—
11th day	1	50.0	1	50.0
30th day[1]	1	100.0	1	50.0
	115	—	41	—

[1] This case was not injected.

A third, but ungrounded, suggestion was that the 1895 type of cases was more conducive to the development of paralysis than that of previous years. Reference to Table VII., which indicates that the percentage of paralysis since 1895 has remained about the same, shows that this was not likely to have been the case. Putting these explanations aside, it may be asked,—Does antitoxin treatment make paralysis more liable to ensue? To this we may, I think, give a decided reply in the negative. The early administration of antitoxin makes paralysis less likely to occur, especially in a severe form. Woollacott[33] has clearly shown this by statistics of cases at the Eastern Hospital. My figures in Table VIII. help to corroborate his views.

In addition to early administration a large dosage tends to render paralysis, especially in a severe form, less likely to occur. The massive doses of serum given to certain members of Class I. help to account for the triviality of the subsequent palsies.[34]

As a general rule the size of the dose was determined by the extent and character of the membrane in the throat, the concomitant adenopathy and involvement of the nares, and the duration of the disease, later forms being given, *ceteris paribus,* larger doses. Very young children receive the same dose as adults.

The doses of antitoxin given in most of the Metropolitan Asylums Board hospitals greatly exceed as a rule those given elsewhere. My own experience has made me agree with the practice of the majority of my colleagues.

Though, as explained above, the character of the primary attack was not definitely fixed until the membrane had disappeared from the throat, an estimate of its nature was formed at the time of injection. On reference to my notes I find that Class I. received 18,000 to 24,000 units on admission usually repeated once, sometimes twice, by injections on the following days. Class II. received 18,000 to 21,000 units on admission. Not infrequently the dose was repeated on the following day.

Class III. received 15,000 to 18,000 units. Usually a single dose was sufficient.

Class IV. received 9,000 to 12,000 units on admission, occasionally repeated the following day.

Class V. received 3,000 to 12,000 units. A second dose was never required.

Class VI. had no antitoxin.

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[33] M. A. B. Reports, 1898.

[34] Cases VII, VIII, IX, XVII.

RELATION OF PARALYSIS TO ALBUMINURIA.

In the great majority of my cases, though by no means in all, albuminuria[35] was present, though not always coincident with the paralysis. In all the severe paralysis-cases albumen was present; in the milder forms, it was present in more than half the cases, though the two complications did not always co-exist.

Like paralysis, I found albuminuria to bear a very definite relation to the character of the primary attack, as will be seen from the annexed table.

TABLE IX.

Showing Relation of Albuminuria to Character of Primary Attack.

	Albuminuric Cases.	Percentage.
Class I.	29	74.1
Class II.	61	63.5
Class III.	17	42.5
Class IV.	59	38.8
Class V.	35	24.3
Class VI.	3	12.5

It is unnecessary for me to give a detailed description of each form of diphtheritic paralysis. Such an account is to be found in the writings of Maingault, Trousseau, Greenhow, Sanné, and Cadet de Gassicourt. It is sufficient to point out the relative frequency of each variety and then to deal with the characters common to all diphtheritic palsies.

By the relative frequency of each variety is shown the predilection of diphtheritic palsy for special sites.

Table X. indicates in order of frequency the various forms of paralysis observed among 500 patients. It illustrates the predominance of the palatal affection, which has been noted from the earliest times. Palsies of the ocular muscles are the next most frequent. Ciliary palsy was more commonly seen than any form of ophthalmoplegia externa. Its presence in young children is very apt to escape notice.

The severer forms of paralysis are fortunately much more uncommon. It must be noted that, though the term palatal palsy includes every degree of impaired innervation from a slightly nasal voice to a complete loss of mobility and sensation of the velum, accompanied with regurgitation, the term cardiac palsy does not apply to any but fatal cases in which death was ushered in by vomiting, restlessness, irregularity of the pulse, and change in the heart-sounds. Had all the cases of cardiac dilatation and ir-

[35] It was present in all the cases described below.

regularity of the pulse been included, which bear the same relation to cardiac palsy that a nasal voice does to paralysis of the palate, the percentage of cardiac palsy would have been much higher.

TABLE X.

Seat of Paralysis.	Cases.	Percentage.
Palatal Palsy	72	Or 14.4
Ciliary Palsy	54	“ 10.8
Strabismus	30	“ 6.0
Cardiac Palsy	20	“ 4.0
Pharyngeal Palsy	9	“ 1.8
Labial Palsy	8	“ 1.6
Diaphragmatic Palsy	7	“ 1.4
Laryngeal Palsy	5	“ 1.0
Sphincter Palsy	2	“ 0.4

CHARACTERS COMMON TO ALL DIPHTHERITIC PALSIES.

I. Time of Onset.—Each individual form of diphtheritic palsy, as will be seen from Table XI., has a period of predilection for its appearance. Thus affection of the palate occurs in the majority of cases towards the end of the third week and first half of the fourth week. In certain very severe cases it may appear much earlier.[36] Such precocious forms indicate a profound intoxication of the nervous system, and are of bad prognosis, early involvement of the palate being often associated with cardiac paralysis. When recovery takes place, the duration of precocious palatal palsy is much longer than when it starts at a later stage.

Though some degree of cardiac affection is liable to be met with several weeks after the acute attack, fatal cases, ushered in by persistent vomiting and restlessness, are most likely to occur within the first fortnight, the days of predilection being the 7th and the 9th.[37]

Affection of the eye-muscles, internal and external, usually starts later than either of the preceding palsies. Loss of accommodation in my cases always preceded squint. Partial ptosis at the same time is not very uncommon, and also a slight degree of nystagmus.

After the first fortnight has passed without any signs of cardiac mischief, no serious palsy, provided the recumbent position be enforced, is likely to supervene till the fifth week—more frequently the seventh,[38] when, especially in young children, a large number of muscles is apt to be involved. The most important of these muscles, whose loss of function may make one overlook inactivity of the rest, are the constrictors of the pharynx and the diaphragm. Pharyngeal and diaphragmatic palsy is very frequently associated with paresis of the facial muscles, producing a vacant expression, which is usually in marked contrast to the real mental state of the patient. Occasionally,[39] only a few of the facial muscles may be picked out, while the others are not affected. The depressor labii inferioris and the platysma on one side are especially liable to be involved, an asymmetry in the outline of the lower lip when the mouth is opened being the result.

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[37] Cases XI, XII, XIII.
[39] Cases I, VIII, XII, XIII.

Affection of the sphincters,[40] an uncommon but occasional phenomenon, may be met with at this time, *i. e.,* from the fifth to the eighth week. Among the later forms of palsy to be noted is a weakness of the neck muscles.[41] This I have seen only in those cases in which a large number of other muscles had been involved. It is first observed when the latter have recovered their power and the patient is propped up in bed. It is not till a still later stage, viz., when the patient is allowed to get up, that the loss of power in the lower limbs[42] is usually noticed unless the general helplessness and wasting of muscles of the thigh and leg have drawn attention to their condition. Of loss of power in the upper limbs, which Maingault and Trousseau said were usually affected after the lower limbs, I have seen very few instances.[43] They occurred during the fifth and sixth weeks, and were mostly ill marked.

TABLE XI.

	Palatial	Ciliary	Strabismus	Cardiac	Pharyngeal	Sabial	Diaphragmatic
1st week	0	0	0	10	0	0	0
2nd week	11	0	0	10	0	0	0
3rd week	24	5	3	—	0	0	0
4th week	14	23	5	—	0	0	0
5th week	7	20	6	—	2	1	1
6th week	11	6	7	—	1	1	1
7th week	4	—	5	—	5	4	—
8th week	0	—	4	—	—	2	5

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[38] Cases I, II, III, VI.

[39] Cases I, II, V.

[40] Case II.

[41] Cases II, XV.

[42] Cases I, II, III.

[43] Case I.

TABLE XII.

Average Day of the Disease on which the various Palsies occurred.

Cardiac	8.8
Palatal	24.6
Ciliary	31.5
Strabismus	32.5
Pharyngeal	42.3
Laryngeal	42.75
Labial	43.15
Diaphragmatic	46.0

Anything like a generalized disturbance of sensation, producing anesthesia, analgesia, paresthesia,[44] does not occur till a later period and is usually associated with severe motor weakness; but as in my cases the bulk of paralysis occurred in young children, who were unable to express what they felt, complete clinical records were not to be obtained.

2. *Duration.*—The duration of each form of diphtheritic palsy, can, as a rule, be approximately fixed. With the exception of the early forms, which in cases that recover[45] are usually persistent, the duration is thus longer than that of any of the other forms, if we exclude loss of power in the lower limbs, the onset of which it is almost impossible to determine in most cases.

Strabismus and cycloplegia usually last about a week less than palatal palsy.

It is most fortunate that the formidable train of symptoms due to paralysis of the pharynx, which is so often associated with paresis, rarely with absolute paralysis of the diaphragm, should on the average last for a shorter time than any of the other forms.[46]

Table XII. shows that the limits are wide between the maximum and minimum duration of each palsy. Some cases are extremely persistent, while many are very transient, lasting only a few days. This leads me on to speak of another striking characteristic of diphtheritic paralysis.

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[44] Cases I, VIII, XV.

[45] Cases I, VIII.

[46] Cases I, II, III, VI.

TABLE XIII.

Nature of Palsy.	Average Duration.	Maximum Duration.	Minimum Duration.
Palatal	25.8 days	65 days	4 days
Ciliary	17.8 "	46 "	5 "
Squint	17.1 "	47 "	7 "
Labial	16.8 "	21 "	8 "
Pharyngeal	12.3 "	26 "	5
Diaphragmatic	12.3 "	19 "	6 "

3. *Abortive Character of the Majority of Diphtheritic Palsies.*—A striking feature is the prevalence of abortive forms. To the majority of diphtheritic palsies the term paresis is more applicable than paralysis; indeed, in many cases, the impairment of function hardly deserves even the former title. It is on this account that so many cases of diphtheritic palsy escape observation; and it is to this, as shown above, that we may, in part at least, attribute the great variation in statistics of different observers of its relative frequency. Unless, as I have always endeavored to do, special examination be made in each case, a slight and transient loss of power is very liable to escape notice.

These semi-latent forms are well exemplified in the case of the two commonest palsies—palatal palsy and cycloplegia. In the mildest forms the palatal affection is detected only by a slight nasal twang of the voice,[47] the loss of mobility of the velum on phonation being hardly perceptible. Ciliary palsy may be so slight that the pupils are of normal size and react to a certain extent to accomodation; for example, if the patient be told to look at his finger and move it towards his nose, contraction of the pupils takes place. Such a patient may, however, be unable to read small print or to pass a thread through the eye of a small bead—acts requiring greater amount of accommodation, which it is beyond the power of the ciliary muscle, slightly impaired though it be, to effect.[48]

The abortive character of diphtheritic paralysis is equally well illustrated in the case of the heart. Here, again, we meet with all degrees of severity,[40] from that form associated with such obstinate and uncontrollable vomiting as almost to constitute an *opprobrium medicinae,* and rapidly producing an algid state, through all intermediate forms to that marked by a slight degree of irregularity of cardiac force and rhythm, and occasional displacement of the apex beat.

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[47] Cases IV, XII. XIII, XVI.
[48] Cases IX, XVII.
[49] Cases I, IV, V, VII, X, XI, XII, XIII, XVI, XVII.

Complete paralysis of the diaphragm is fortunately much less common than a slight impairment of its function[50] which is very likely to occur at the time that the pharynx becomes affected, and reveals itself in exaggeration of the costal at the expense of the abdominal movements. The color remains fairly good, though the respiration may be somewhat hurried and shallow.

The self-assertive phenomena of pharyngeal and diaphragmatic palsy have, as I have already pointed out, a tendency to divert attention from such comparatively trivial incidents as the coincident weakness of the muscles of the face, lips, and tongue. Affection of the facial muscles[51] in diphtheritic paralysis of which Trousseau[52] has drawn so striking a picture, and which has been alluded to by subsequent writers, *e. g.*, Sanné[52] and Wilks,[52] though incomplete, is none the less definite. It is surprising that Gee should regard such palsies as improbable.[53]

4. *Fluctuating Character of Diphtheritic Palsy.*—Closely associated with the last is the tendency to exacerbations and remissions that diphtheritic palsy so frequently presents. The onset is never at once sudden and complete. A slight impairment of function is noticed one day,[54] and the next is no longer found; but after an interval of varying duration it reappears and becomes more marked. Thus the voice may assume a nasal twang on the seventeenth day, and for the next few days be apparently quite clear. On the twenty-first, regurgitation occurs, and the sound of the voice now confirms the diagnosis of paralysis.

Strabismus may frequently have developed some days before it attracts the attention of the doctor at his visit. Nurses have often told me that they have seen a patient squint for a few moments during the day, for several days before I could detect anything abnormal on making my round.[55]

This tendency to fluctuation is of greatest practical interest, and is best illustrated in the case of the heart. It is very common to meet with some degree of paresis, *e. g.*, outward displacement of the apex-beat, increase of cardiac dulness, impairment of the first sound, embryocardia or gallop-rhythm, at one visit, and at the next to find the heart apparently quite normal.

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[50] Cases II, III, VI.

[51] Cases I, II, V.

[52] Loc. cit.

[53] Allbutt's System of Medicine. Palsies of the œsophagus, tongue, lips and cheeks are possible, but very improbable occurrences.

[54] Cases III, VI.

[55] Case VII.

So too with the pulse; marked inequality of the two radials, complete absence of one, the loss of palmar recurrence, and sometimes complete radial asphygmia, may be met with in the morning, and in the evening the pulses are equal and fairly strong. These temporary ameliorations,[56] which are independent of medicinal treatment, so far from being of good omen, are characteristic of fatal cardiac paralysis. The prolongation of the death agony, which is sometimes spread out over several days, during which the color may temporarily improve, the pulses become stronger, the limbs warmer, the heart-sounds more forcible and regular, and the apathy and restlessness remit, is a very distressing feature, reminding one of the delusive improvements in tuberculous meningitis, so apt to engender false hopes and to induce a belief that a reprieve has been granted.

5. *Resemblance to Syphilis.*—In its frequent mal-development, its fluctuating character, its predilection for the ocular muscles, and its liability to follow an untreated initial lesion, diphtheritic paralysis bears more than a slight resemblance to the palsies of cerebral syphilis. Untreated diphtheria, like untreated syphilis, is apt to avenge the slight, though it does not nurse its resentment so long before punishing its victim. In less figurative language, the interval between the primary disease and the subsequent impairment of innervation, which in diphtheria is represented by days or weeks, in syphilis is measured by months or years.

Contrary, however, to what I have shown to be the rule in diphtheria, in syphilis the character of the original attack bears no relation to the later phenomena. Not only are all forms of syphilis liable to be followed by severe damage to the nervous system, but it is the primarily mild attacks that are most exposed to this eventuality.[57]

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[56] Case XII.

[57] A. Fournier: Syphilis du Cerveau.

(*To be continued.*)

ON SOME OF THE MORE UNUSUAL FORMS OF EPILEPSY.[1]

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STUDY OF EPILEPSY: MEMBER NEW YORK ACADEMY OF MEDICINE: AMERICAN NEUROLOGICAL ASSOCIATION, ETC.

Beyond a few lectures, at most, the average physician learns little of epilepsy during his student days, and it is safe to say that not five physicians in a hundred enter private practice equipped with a knowledge of epilepsy in all its forms.

The day of speaking simply of epilepsy is gone. We must now refer to the epilepsies, so numerous are its types and subdivisions. The well nigh universal conception of the disease is of the grand mal form, which is more common than all of the other forms combined. But there are enough of the less common forms to make it important that they be understood.

THE PSYCHIC EPILEPTIC EQUIVALENT.

Some neurologists do not believe in the so-called psychic epileptic equivalent, which means a period of mental disturbance that appears as a substitute for a seizure of the ordinary kind. In all probability it never exists as an absolutely independent affection, but is always associated in some degree with an attack so mild as to be unrecognizable except under close observation.

For instance, an unskilled observer may be watching a person at the moment that person is having an epileptic seizure of this type, and fail to note that anything unusual is occurring. Then, when the period of mental disturbance comes on after the attack is over, such disturbance is mistaken for an independent condition and called a substitute for an attack, instead of being a result.

It goes without saying that nocturnal epilepsy may give rise the following day to mental confusion that may be mistaken for an epileptic equivalent, and the only way to satisfy ourselves that such is not the case, is to have the patient carefully watched during the night and to examine him the following morning for physical evidences of an epileptic seizure, such as a lacerated tongue, bruises, etc. Blood on the pillow and evidences of urinary incontinence may also point to the occurrence of a seizure.

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[1] Courtesy of Editor St. Louis Medical Review.

The epileptic equivalent state is in reality an acute insanity, during which the patient may unconsciously be guilty of any crime. From a medico-legal standpoint this condition is of great interest, and, from that of the welfare of the patient, it requires the same watchful treatment demanded by the acutely insane.

PSYCHIC EPILEPSY.

This unique form of epilepsy is distinguished from the psychic epileptic equivalent by the absence usually of any muscular commotion whatever, except, possibly, some fine fibrillary twitchings of the muscles about the mouth.

So long as a patient is left to his own resources while in this state he is generally harmless, but any attempt to coerce him or any interference with him in any way is liable to arouse a combative spirit, and may lead to a display of great violence. It is curious how the instinct of self preservation seems to be automatically preserved at such times. Such a state may last anywhere from a few seconds up to days and even weeks. An epileptic writing a letter, or engaged in conversation, may hesitate for a moment in his writing, or what is quite common, repeat the same sentence several times, or if speaking, he may suddenly hesitate, turn pale, show some dilatation of the pupils, some fine muscular tremors about the mouth, and appear momentarily to be staring into space, only to return to his natural state without any evidence whatever of anything having gone wrong. Sometimes when this state lasts for days the patient becomes a mere automaton—a machine acting without intellectual direction—and yet during it all he is capable of performing unconsciously and correctly his daily routine vocations in a natural and unhesitating manner.

While automatic such patients appear to labor under a tension —a nervous tension if I may use that term—for, although they may be perfectly tranquil through it all, after it is over they are often more or less prostrated and nearly always suffer from a violent headache.

TETANOID EPILEPSY.

Attention was first called to this rare form of the disease by Prichard, in 1882.

The spasm in an ordinary grand mal attack is divided into two parts, tonic and clonic, both being manifested to some extent in every case. Just why both are essential is not understood. It would seem that the tonic contraction alone would suffice for the liberation of nervous energy. But this is not the case. Tetanoid is virtually the same as tonic, consisting as it does of tetanic or tonic-like contractions that occur wholly independent of clonic movements whatever.

Tetanoid epilepsy is apt to be confounded with tetanus, whereas they have nothing in common further than the disease picture that is present for a short while only in epilepsy—or so long as the active stage of the convulsion lasts—and for a much longer period in tetanus.

Gowers speaks of patients "falling unconscious in such attacks remaining rigid a few moments and then getting better." This brief state of great rigidity is the one characteristic of the disease.

It may be the cause of death in any case. Jones speaks of "a very perilous and fortunately very rare" form of tonic contraction that holds the muscles of the chest in a state of rigidity long enough to cause death. I have witnessed a fatal termination in several cases of the kind—death occurring in one instance while the patient was standing upright, the body remaining in a state of marked rigidity for five minutes after death.

Clinically and pathogenetically we may look upon tetanoid epilepsy as an accentuated first stage of a grand mal attack, clonic contractions for reasons now unknown being omitted.

MYOCLONUS EPILEPSY.

Unverricht first called attention to this form of the disease, in 1891, designating it "family myoclonus."

It is an association disease characterized by paroxysmal asynchronous, bilateral, rapid contractions of the muscles of the trunk and extremities that appear coincidently with grand mal epilepsy. It is generally due to heredity, and is oftenest immediately excited by some form of mental stress. It occurs most frequently during adolescence and about one-half of the cases are preceded by epilepsy proper. The diagnosis is usually not difficult. The lightning-like contractions of the trunk and the proximal muscles of the extremities which are not possible at will, and which do not occur in any other disease, should put the diagnosis beyond question. Such epileptics are less curable than those of other types, and they likewise have a shorter lease of life.

The lesion is in the cortex of the brain, though the spinal cord and the muscles most affected may show secondary changes. In studying such cases, it is well to bear in mind their dual character—the myoclonic and the epileptic state being merely associated in the same individual, each having a separate morbid entity.

MATERNAL FEEDING.

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The desirability of breast feeding needs no emphasis with those interested in the welfare of babies, and in a company of pediatricians goes without elaboration.

The subject of why so many mothers are unable to furnish breast milk is one that may be dwelt upon occasionally with profit. The sources of failure lie first and most often with the ancestry, two or more generations removed at times. In other words, inability to produce sufficient breast milk of proper quality is most frequently a form of degeneracy, and is associated with deformed pelvis, obesity, hysteria, epilepsy and other neuroses of greater or less degree in the mother or her ancestors.

Investigation made recently by Prof. Bunge of 1,629 German mothers resulted in a startling statement of alcoholic habits in the ancestry as a blighting cause of imperfect breast feeding. The figures also were startling as to the number of German women incapable of nursing their babies—only 519 out of 1,629 reported cases were able perfectly to nourish their babies at the breast for nine months without supplemental feeding.

I believe our American mothers can make a better record than that, though the defect is found too frequently to permit us to remain complacent over the matter.

Degeneracy, then, in the mother is one of the chief causes leading to imperfect lactation. It produces the imperfectly developed gland structure, inversion of the nipple with deforming fissures, and occasionally entire absence of the nipple. It checks the quantity and no doubt alters the quality of the milk, and the condition does not yield to treatment—which is the sorry part of the situation.

Outside of degeneracy we may have accidental causes, such as complication in labor or the puerperium, severe hemorrhage with resulting anemia, eclampsia, with affections of the kidneys, severe puerperal infections, mammary abscesses, etc. Chronic wasting disease, such as tuberculosis, and infectious diseases, as typhoid fever, always check the ability to nurse, and breast feeding is contra-indicated in such cases, as it is in diseased condition of the glands from tumors, etc.

Fissured and ulcerated nipples often have been causes for weaning a child from the breast. They should not be, however, as a skillful handling of such cases always results in a cure, and no physician should permit such simple complications to result in such a grave error as artificial feeding of the baby.

Bad nursing habits on the part of the mother, together with bad general habits in regard to exercise, diet, sleep and rest, are, I believe, often responsible for the loss of an otherwise good, healthy flow of milk.

The physician is often responsible for yielding to the wishes of the patients. Not having a clear idea himself of the physiology of lactation, he does not intelligently instruct the mother.

The baby is sometimes at fault. Some babies refuse to take the mother's nipple in the usual instinctive way after birth, and for fear of starvation a bottle is given and the mother's milk allowed to vanish. We have had several infants to treat in the nursery where this has been the case. Most of these cases can be corrected by patient handling, though they are baffling at times.

Again, the infant does not seem to be able to assimilate the mother's milk, and yet becomes satisfied on artificial feeding. I have had a few such in my practice.

Illegitimacy never in my practice constitutes a barrier to maternal nursing. It is mentioned here, however, because I find the community filled with physicians who seem to think because a child is born out of wedlock, that of itself forms a legitimate reason for its mother refusing her breast immediately it is born and putting the infant on the bottle. Doctors. nurses, relatives and hospital attachés work together to rob the baby of its first and most important birthright, its mother's milk, and call it "charity" when they have pushed the little weakling into some public or private "home" for untrained people to struggle with, and—bury after the tragedy is over.

Pregnancy often cuts short a nursing period, but also often permits of partial feeding at the breast for several months, when the infant is delicate and the mother robust.

Remedies: To remedy errors in maternal feeding, as Oliver Wendell Holmes suggested, begin with the ancestors several generations before the baby is born. See that they are temperate, well-ordered people, living simple lives. Having arrived too late with that, begin with the baby. Assume that the mother will have enough milk for its proper nourishment, and fight hard, if necessary, for it. Like the pregnant woman, the lying-in woman must live a normal, simple life, and most people live so much on artificial lines that the physician should at times carefully direct her habits. The diet, exercise, cathartics, nursing habits and care of the breasts and nipples should receive careful attention by the physician.

How often should the baby nurse? When should it be applied to the breast after birth, and at what intervals thereafter? How long should it be left at the nipple? What quantity of milk should it receive? And how long should the infant receive only breast milk?

The following rules have been found satisfactory in a large number of patients: After birth in normal cases apply the infant in the course of an hour or so to the breast to check hemorrhage in the mother and to make the most of the infant's first instinct to suck. Allow it to pull on the nipple not more than ten minutes for the first few nursings, to protect the nipple from maceration and abrasion. Repeat every six hours during the first twenty-four, every four hours during the second twenty-four, every three hours during the third twenty-four, every two hours during the fourth day, and every three hours at night or at longer intervals when the baby is satisfied. This schedule is kept up for the first two weeks, except when the infant gets three or more ounces at a nursing (which is determined by weighing before and after feeding). In such cases the child will usually be satisfied and thrive with longer intervals between feedings. No hard and fast rule is held, as we find each baby with its mother a study, and no law can be laid down except the law of reason..

As soon as a child gets 3 ounces regularly at each nursing, the interval is changed to 2½ hours during the day and 3 hours during the night. When 3½ or 4 ounces are taken, a three-hour interval is given during the day and four or longer at night.

By a systematic weight test in young babies during the first two weeks of life, it is seen at once that the average baby gets a varying quantity of milk at each nursing, and when a law of nursing is arbitrarily made and each child held to it, a good deal of trouble is experienced in satisfying the baby. For instance, an infant in its second week cannot be made to nurse every two hours if it gets 4 ounces at each meal. It will simply sleep when offered the breast, shoving the nipple out of the mouth and resisting all efforts to make it nurse; but if the milk has been scanty and only 1½ ounces has been taken at the last meal, it will be crying with hunger at the end of two hours, if it be a healthy, well-developed infant. For intelligent management we should determine the amount which the baby obtains at each meal and be governed accordingly.

Care of the breasts: A breast binder for support is applied on the second day. The diet of the mother is plain, easily digested food from the first—not "anything she wants," but carefully selected and simply prepared food, with a slight excess of fluids. The cathartic should be selected with due regard to its effect upon the breasts; salines only when they are inclined to turgescence; senna to be avoided because of its effect on the infant through the milk. Calomel often is the best when the mother's elimination has been poor. Castor oil is safe, alternating with enemata. Cascara is favored when the patient is up and about.

Exercise forms a much-neglected element toward good nursing. The secretions of the body are healthy only when the proper equilibrium of rest, exercise, food and elimination are maintained. Errors are often seen in the management of wet nurses along these lines. Not long ago I knew of a healthy wet nurse being taken into a physician's family to nurse his sick baby. The nurse was but three weeks over her confinement and not a thoroughly robust person, though with a good flow of milk. She was asked to nurse the sick child every two hours day and night, sitting one-half hour with him at each feeding, which meant being allowed to sleep only one and one-half hours without interruption at night, and that by the sick child's bedside. It is needless to say she was dismissed as having no milk at the end of a couple of weeks, though she had succeeded in taking the child through the crisis of its disease safely. She returned to her own infant, which she successfully nursed, its weight being 28 pounds at ten months, though some small amount of supplemental feeding was done, one bottle given daily of modified milk, I believe.

A good wet nurse can be spoilt by poor management in a week. They are not obliged to live simply as to food, are not given proper exercise, fresh air and sleep. The latter is a very important element. They are often urged to drink beer and take hearty foods, and are housed up with the baby in one room till the blood and secretions are full of toxins and the baby begins to vomit and suffer from colic, with green stools, and the wet nurse is sent packing, another secured and the same experience gone over till the principals are ready to tell you: "Don't suggest wet nursing; we have tried it and it was a failure."

When breast milk is scanty the mother should receive careful attention as to elimination, errors in diet, rest, etc. If the mammary glands are not too small they can be made to yield a larger quantity by demanding it from them persistently at regular intervals by applying a robust baby that will suck vigorously. A mistake is made in reducing the nursing intervals to only a few in 24 hours. When the mother is found to lack quantity she should be asked to nurse at regular, reasonable intervals, and to give a bottle to the baby following the application to the breast in order fully to satisfy it. This process will often stimulate the glands to a greater supply of milk, and will be just as satisfactory in feeding the baby.

The baby: The baby is sometimes the cause of its not being blest with maternal feeding. Certain babies persistently refuse to take the nipple from birth. Such cases are very hard to manage at times. The milk is so scanty or of such peculiar flavor that the baby will not work for it and will starve itself, though the nipple is offered by the mother with earnest patience. I have met a few such cases, most of them overcome by patient effort; but occasionally where the milk is scanty the breasts cease to secrete from lack of stimulation. A willing baby, if possible, should be secured in such a case; the wet nurse and her baby making an exchange of infants often will correct the matter. When such a remedy cannot be had and the child will not give up its stubborn refusal to nurse, there is no help for it but the bottle. The mother's milk in such cases is scanty at best, or so it seemed in all cases I have dealt with where the baby could not be taught to nurse. These infants usually take the bottle with no hesitation, and will also take a wet nurse's breast when hungry if the breast be one that yields milk easily.

A mother's milk changes often in character after a time, and will agree with her baby after a week or so of exchange of infants with a wet nurse. I treated successfully such a case last spring, succeeding in partial maternal feeding with a mother where her first child had been weaned because of an apparent idiosyncrasy for its mother's milk. The second child began to develop the same symptoms of indigestion as the first—green stools, colicky screaming for hours at a time, loss in weight and general signs of distress. Supplemental feeding gave but little relief, so a wet nurse and her baby were introduced, to test the milk with another child. Both babies did well, and at the end of two weeks the nurse was discharged and the mother successfully nursed her own child, though after a short time the quantity of milk did not prove quite sufficient and a little supplemental feeding was resorted to. The child became a fine, healthy infant and withstood an attack of whooping-cough at five months, coming through it in splendid condition, depending almost wholly on the breast milk while coughing.

In cases of mammary abscess, unless the gland is very extensively involved or the discharge so near the nipple as to endanger the infection of the child, after the part has been freely lanced and drained I apply the baby to the breast, and do not endeavor to dry the milk on that side.

In cases of puerperal infection, unless the case is a grave one and the mother losing ground, the child is kept nursing, though some supplemental feeding is done.

In grave cases of eclampsia the secretion of the milk is delayed, and often faulty when established. When the kidneys are involved, I find it detrimental to the mother to try to nurse her baby. In secondary anemias the milk can nearly always be saved to a child as convalescence progresses.

As to the length of time breast milk should be given, some simple food, like properly prepared bread and milk, should be begun at the eighth or ninth month, or cow's milk with some of the cereal gruels to dilute it. Supplemental feeding can always be given when the breast milk is not sufficient, but care should be taken, as suggested before, not to let it supplant the breast milk by long intervals of nursing.

Just a word as to the illegitimate mother—why she should nurse her baby. First, because it is her duty and the baby's incontestible right, and because she can do nothing else while convalescing; next, because it is almost a crime to allow her to destroy such a life-giving element as good breast milk. She can make a good livelihood, if poor, by wet nursing, if she does not wish to accept the shelter of charity institutions provided for her and her baby.

Wet nursing is not demoralizing if the nurse is given sufficient salary to pay for skilled care to her own baby, and if she be made to maintain it while she is nursing a stranger's; but it is often the case that those who employ her discourage her from caring for her own infant solely from selfish and mercenary reasons, and after they have induced her to desert her own baby they are shocked to find her calmly deserting theirs.

As breast milk is often the only thing which will save a baby's life, all sources of its supply should be guarded with religious care.

SOCIETY PROCEEDINGS

BETHESDA PEDIATRIC SOCIETY

October 27, 1905

Dr. John Zahorsky made a preliminary report of an investigation that he is making into the source and significance of Green Stools. After giving a résumé of the work of the authorities on this subject, he described four tests by which he had attempted to prove or disprove the reputed presence and rôle of the bile products. The alcohol, and the acetic acid tests did not point to the presence of biliverdin. Secondly, that its source is mucus does not seem quite clear, since the green pigment is most often intimately associated with the caseine-products. This does not support Wernstedt's idea. Gmelins' test, applied to green stools gave very slight reactions indeed, and not greater than with stools of normal or other color. Lastly, the presence of oxidase cannot account for the phenomenon, since it was to be found in all stools. It seems possible, however, that this ferment may have something to do with the color when there is much bile in the stool. That the green stool is due to the presence of biliprasin, as stated by a French authority, does not seem any more probable, since the test for this substance with NaOH did not reveal its presence.

Dr. Carl Fisch stated that he was glad to find that Dr. Zahorsky had also shown that the green pigment is not biliverdin, there had been no proof ever advanced that it was. It is most probable that the pigment develops because of contact with some constituent of the atmosphere, perhaps oxygen. Oxidase is present in all the cells of the body and if the pigment is due to this ferment the color should develop earlier than it does.

Dr. Phil. Hoffmann described a new operation that he had performed five weeks ago, for transplantation of tendons, the object of this operation being to utilize a healthy biceps for obtaining use of the fingers; uniting the tendons of the flexor carpi ulnaris, flexor carpi radialis and palmaris longus at the wrist, to the flexor sublimis and flexor profundus digitorum; and at the elbow to the tendon by the biceps, the muscles of the forearm being paralyzed and atrophic, and in this way being used simply as a connecting cord, above and below, Dr. Zahorsky questioned whether the atrophic muscles of the forearm would resist the tonus of the biceps sufficiently to remain of great use.

Dr. Wm. L. Johnson reported two cases; one a case of pyelonephrosis in a child of nine months, and the other a case of what was most probably a general miliary tuberculosis, both cases presented very obscure symptoms and were of interest because of their atypical characters.

EDITORIAL

SOME PROBLEMS OF ADOLESCENCE.

The Maine famer who excused the psychological vagaries of his fifteen-year-old son on the ground that "Dan'el had had a turrible hard winter—he'd had the measles and fell in love with the schoolma'am and got religion, and you couldn't expect him to be good for nothin' yet a while," may have intended a piece of rustic facetiousness or may simply have been stating the truth as he saw it; but that he had voiced, whether inadvertently or deliberately, a fundamental relationship between the psychological processes characteristic of that period of life one must admit after reading Stanley Hall's discussion of the "adolescent psychology of conversion," or, indeed, after being in any degree familiar at first hand with the phenomena in question.

Dr. Hall establishes by exhaustive statistics the fact, which one would be inclined to affirm from casual observation, that conversion belongs normally to the period of adolescence and that by far the greatest proportion of conversions do occur between the ages of fourteen and eighteen. While deprecating as all reasonable minds must the extravagant manifestations witnessed at some of the more emotional revivals, and expressing gratification at the unmistakable if gradual tendency toward the discarding of the doctrinal threats with which Jonathan Edwards and his successors were wont to terrify seekers after salvation, Dr. Hall emphasizes the fact that conversion is a normal phenomenon, a phase of that awakening to consciousness as a representative of the species, of the moment "when life pivots over from an autocentric to an heterocentric basis," and in its finer and saner forms meets, in its suggestion of service and self sacrifice, that sense of imperfection and incompleteness that inevitably supervenes upon the limitless aspirations of early youth. He finds no degradation, either, in the recognition of the intimate relationship indicated by the fact that the age of religion and that of sexual maturity coincide. Such an idea of degradation could be possible only to those "who think vilely about sex or who lack insight into its real psychic nature and so fail to realize how indissoluble is the bond that God and nature have wrought between religion and love."

"Love is the greatest thing in the world for both the religionist and the amorist. Both religion and love furnish in their sphere the strongest motive both to assert and to renounce the will to live. They are exalted and degraded together, and the best work of each is to keep the other pure."

Dr. Hall goes on to note some of the similarities and convariants of love and religion, and collects a most interesting list, including the fact that both are reductive of individuality, in the subordination of this life to the next and to posterity, that both make the soul highly sensitive to nature, that both have their fanaticisms, that both adopt rhythmical expression, that both exalt the individual as well as abase him, that both have their formalities, rituals, if you please, and that the "nest building" instincts of the lover find a parallel in the erection of shrines and cathedrals. Many other such parallelisms might be traced, and even the perversions of both love and religion are analogous in the amatory fetishes of the one and the idolatry of the other.

To repeat, Dr. Hall finds both love and religion natural phenomena of adolescence and "both are often at their purest and best" at that time. He says that true and deep religious experience is almost impossible before adolescence, and deprecates those attempts to carry on revivals among little children which result, as all precocity must, in a waste of real powers. On the other hand, conversion coming at its proper time gives "fulness and completeness to the moral changes of these years as nothing else can do." Nor is the value any less because as the mind matures it may pass beyond the religious experiences of adolescence. If those were of the fine and normal type, especially there is nothing to lose as the mind develops, and the chances of experiencing that type rather than the extremely doctrinal or extremely emotional are growing happily better with each generation.

Still, this is the time when the young girl or boy is in particular need of wise and intelligent sympathy from those who are responsible for his guidance, and in a subsequent chapter Dr. Hall touches the keynote of the matter when he puts in a plea for the dignity of these young people. Too many older people are prone to treat lightly the matters which seem of paramount moment to the young, and if this is less apt to be true in regard to religious matters, it is fatally so in those pertaining to love affairs. Yet no greater mistake than to treat lightly a case of "boy and girl love" can be made, since the one who so treats it, whether by look or word, is at once made powerless either to prevent it from working mischief or to utilize for good the opportunities it offers. Take it seriously, and you may be able to help the child take it sanely. Oppose it, and you become an antagonist; laugh at it, and you are shut out from all knowledge of it. But help him idealize it; help him translate it into terms of conduct on the basis of that idealizing, and you stand a good chance of guiding him safely over the shoals and rapids into the deeper, quieter waters of maturity. A certain girl of fifteen, a beautiful young animal with all sorts of storms let loose in her soul, thought to find chance for defiance of her teacher in bringing to class a photograph of the boy she was interested in at that time. The teacher, however, accepted it serenely and seemed to expect better work from the girl because of this reminder of her affection for the boy—and got it. That girl grew up and married quite a different sort of man in the end, but the youthful love affair had done its work safely, sanely and sweetly, as such things should.

Only let the parents, teachers and doctors of the land realize the real significance of this period of adolescence and many of its most vital problems will find solution.

A SYMPOSIUM ON RHEUMATISM IN CHILDREN.

At a recent meeting of the Pediatric Section of the New York Academy of Medicine an important and original series of papers was presented dealing with the subject of acute rheumatism in children.

In the opening paper by Dr. Bovaird the more recent views of the pathology and etiology of the affection were discussed. He emphasized the opinion which has now come to be almost universal that rheumatism is an acute infectious disease of bacterial origin but was not in a position to state that this organism had been isolated. Whether it is a specific one, or one of the coccus type is not known although the diplococcus of Poynton and Paine is entitled to be seriously considered.

It seems not improbable that the throat, and particularly the tonsils, are implicated most seriously as the avenues of entrance of the organism and the well known relationship of sore throat and tonsillitis to rheumatism would tend to bear out this hypothesis. Statistical inquiries, bearing on the coincidence of tonsillitis and rheumatism, as gathered by W. McConnell at the Vanderbilt Clinic, show that no less than thirty-five per cent. show the relationship. These were all well marked cases of tonsillitis involvement. If the milder sorts were included the percentage was much higher.

From the symptomatology Dr. McConnell's review of 10,000 patients, as coming under observation at the Clinic for children's diseases some striking results may be obtained. Of these at least eight per cent. suffered from some form of rheumatic affection. As stated at least thirty-five per cent. began as acute tonsillitis; in eleven per cent. there were some cardiac preliminaries. In twenty-four per cent. the first symptoms were in the joints. In seventy-five per cent. of the chosen cases there were cardiac disturbances.

Dr. C. G. Kerley in discussing differential diagnosis said that under fifteen months of age rheumatic involvements were extremely rare and seldom up to two years. From five to ten years of age were the times of commonest infection. Scurvy is the most frequent perturbing factor in diagnosis. Here the age and gum condition, as well as other symptoms are helpful. Careless physicians only will confuse tuberculous hip and knee joint affections with acute rheumatism. Yet the mistake is being made daily. Pott's disease should not be overlooked.

As prophylaxis means eternal vigilance and this is not always practical, Dr. Crandall brought out some of the more immediately helpful suggestions in this field. Cold and wet feet are to be avoided, and confinement in hot, dry rooms, without outdoor exercise is particularly harmful. Too much romping, with exposure following is also to be avoided. The clothing is to be considered, particularly in children who have a tendency to sore throats. The vagaries of many parents and even some doctors who insist on bare legs, and underclad children in carrying out the so called "hardening" process should be curbed. All sore throats should be zealously treated.

As for the medicinal treatment of the condition the salicylates maintain their hold. They are not specific, however, in any sense, and it is doubtful if they are not only good analgesics, but they are the best remedies we have. Dr. Holt speaking of the high doses given by English writers suggested that they might be useful in many of the chronic conditions sometimes found in this country.

ABSTRACTS

The Function of the Tibialis Anticus Muscle as Regards Its Relation to the Pathogenesis of Static Mechanical Flatfoot.—RAFFAELO GIANI (Zeit. f. Orth., Chir., Band XIV, Heft 1).—The writer reports a case as follows: A boy who had his leg run over by a street car sustained a crushed wound extending over the anterior outer side of the leg, thereby stretching its middle third and injuring the muscles lying beneath. The child recovered, but on beginning to use the leg, it was noticed that there was a continually increasing tendency to equinus. Two years later an examination revealed the fact that the belly of the tibialis anticus muscle had disappeared in the region of the wound. There was no reaction to the Faradic current. The author cites this case to show that damage to the muscle may lead to pure equinus. Reasoning from this conclusion, experiments were done on three hundred normal individuals of every age, the tibialis anticus muscle being stimulated by Faradic current. The results are tabulated, and show that the tibialis anticus may or may not have adducting power. The conclusion, therefore, is that this muscle, aside from its function of activity, has a passive function of maintaining the internal arch by holding up its vertex—namely, the internal cuneiform.

The Pathology of Joint Contractures.—J. V. MIKULICZ, (Zeit f. Orth. Chir., Band XIII, Heft 2-3).—As the knee joint is the best joint for study, the writer confines himself to this joint, and discusses the theoretic side, leaving the more detailed report to Dr. Ludloff. By joint contraction is meant a partial or complete limitation of active and passive motion, with the exception of true ankyloses. Mikulicz, in this paper, reports on the origin of orthrogenous contracture chiefly, while Ludloff reports the primary myogenous and neurogenous contractures. In the pathogenesis of arthrogenous contractures there are three factors: (1) The position of the joint is brought about by the muscles moving it. This is not reflex, but is due to equal inactivity of all the muscles. It is in a mid-position that muscles and bands are equally inactive, for pain is least in such a position, Hence the knee is placed in a partially flexed position. (2) A change in the capsule and ligaments. On account of pathogenic thickening and contraction, their elasticity is lost, and the motion in the joint is limited. (3) Changes in the bone.

The Pathology and Therapy of Joint Contractures.—H. GOGHT, (Zeit f. Orth. Chir., Band XIII, Heft 2-3).—

Due to the fact that flexors usually show the first pathologic change, pathologic contractures occur in flexion. The author gives a list of the flexion contractures for various joints, also a list of the best positions for functional use of the same joint. He lays down for principles of treatment the following: Immobilize the joint as long as it is inflamed or painful. Care must be used to correct inflamed contracted joints, the correction being done slowly, without narcosis and without pain. The joint should be distracted during the act of correction. The distraction thus gained must be held after correction by the proper plaster dressing. After the position of complete correction is obtained, it should be held with apparatus. The same principles of caution hold good for joints that are no longer inflamed, except that narcosis may be used. A tuberculous joint should not be mobilized, but where the stiffness is due to other cause the joint should be made as mobile as possible.

Joint Inflammation in Sucklings, and Their Etiological Relation to Later Deformities.—G. Drehmann (Zeit. f. Orth. Chir., Band XIII, Heft 2-3).—After a review of the literature and report of cases, the author concludes that these typical joint inflammations that appear in early infancy, even as early as the second week, and are signalized by swelling and contraction, present a relatively good prognosis. The etiology is little understood. The symptoms may last several weeks, and may lead to suppuration. He is of the opinion that a relationship exists between these affections and subsequent deformity, such as coxa vara and dislocation of the hips.

Limitations of Erasions in Coxalgia. Third Paper.—R. Tunstall Taylor, Baltimore American Journ. Orth. Surgery, July, 1905).—In two previous papers the author outlined what he has termed "combined treatment" in coxalgia—that is, he emphasized the value of the x-ray as a means of making a diagnosis as well as the necessity of using the well-known mechanical measures for hip disease, as if no operative treatment of erasion or attempted extirpation of the disease had been attempted. He divided the cases suitable for operative treatment into three groups: (1) Beginning cases, where the focus is very small indeed, well within the bone, and not encroaching on the joint surfaces. These cases we may leave to conservative methods of rest, fixation and traction, in the hope that nature will resist further inroads of the process, as we all know that it is possible to obtain a cure in early cases. Such cases should have x-ray examinations made from time to time in order to determine extension or actual joint invasion. (2) If extension is found, then erasion must be done if acute symptoms persist. (3) If the case has extensive sinuses, which are secondarily infected, the patient's condition is bad, and the skiagram shows extensive joint destruction, nothing can be gained by erasion or incision. Our best plan is then to lay the sinuses open wide and overcome the secondary infection as soon as possible. Experience has taught us the practical impossibility of helping these cases by extensive bone operation from the prolonged suppuration that usually follows with fever and amyloid changes. The author, therefore, only urges the operation of erasion on what might be called cases of moderate bone involvement, or those in class 2 in which acute symptoms persist. He wishes to call especial attention to the importance of carefully choosing this middle class of cases for erasion. Oftentimes surgeons, ignorant of the subsequent history, or those who do not follow up such cases, fortified by the triumphs of asepsis, lose sight of the relapses which occur when these cases are not properly treated by mechanical means. Erasion is of unquestionable value in properly selected cases, but unwarranted where improvement is seen by conservative methods. The author is convinced, after an experience of some twenty-five cases of erasion on tuberculous joints, that the so-called conservative measures give the largest percentage of success. The age of the disease is more responsible for the shortening than the age of the child when erasion is done. But the epiphyses in joints of children are no place for radical surgery. What we are after are end-results, viz.: A joint that approaches normal in mobility and function and a limb as little impaired by shortening and atrophy as possible. The author mentions three cases as types in which the temptation was great to do erasion, but the abatement in acute symptoms and the steady improvement in joint conditions contraindicated such a step.

Prolonged Remission of Symptoms in Tuberculous Meningitis of Children.—Carrière et Lhote (Rev. de Méd., July 10, 1905).—This is a long and interesting paper, in which the authors discuss the symptom-complex of meningeal tuberculosis as it is described in the text-books, and also give details of cases presenting unusual features, which have come under their own observation. At the onset attention is called to the lessening of the severity of the symptoms which often occurs in the second stage of the disease, an improvement which lasts a few days or at most a couple of weeks, and which may give rise to delusive hopes of impending recovery. This the authors call the "simple remission"; it is described in all the classical works. What the authors call the "prolonged remission" differs in its length, which may extend to many months or even some years, in the more complete disappearance of symptoms, and in its rarity. Seven notices of this prolonged remission collected from the literature are cited, but doubt is cast, not unreasonably, on the diagnosis of three of the cases. The authors lay stress on the absolute necessity of verifying the diagnosis beyond all cavil; it cannot be made on the symptoms alone, but must be confirmed during life by discovery of choroidal tubercles, by discovery of Koch's bacillus in the cerebro-spinal fluid or production of tuberculosis by injection of the fluid into a guinea-pig, or after death by careful *autopsy*. In the four cases which have come under their own notice, and which are given in detail, the diagnosis was confirmed by one or more of these methods. Case I. A child of five years was ill for three months, at the end of that time being discharged from hospital apparently cured; eight months later he relapsed and died after twelve days' illness. Lumbar puncture during the first illness yielded a fluid rich in lymphocytes, which, injected into a guinea-pig, caused death from generalised tubercle in nine months; injection of the fluid withdrawn during the relapse produced the same effect in twenty days. Case II. A child of seven years was ill four and a half months, remitted for three months, relapsed and died in a week. Case III. Illness lasting five months was followed by seven months of good health, and this again by relapse and death in six days. Case IV. Illness of four months, then four months of fair health, then relapse and death in a week. *Autopsy* showed a recent development of tubercles about a sclerosed plaque of old tuberculous meningitis in the region of the left Rolandic fissure. Having commented on the rarity of prolonged remissions such as they have described and discussed the possible reasons for them, the authors suggest as an explanation of the almost uniform fatality shown by statistics to attend the attacks, that many of these may be relapses after prolonged remissions, the first attack having been lost sight of. Their experience shows that the etiology of the remittent differs in no way from that of the ordinary type of the disease. From careful examination during the remission it appears that while the other systems are normal, the nervous system commonly shows traces of existing cerebral irritation: such are slight squint, weakness of pupil reaction, slight nystagmus in the extreme positions, slight muscular tremor, particularly of the frowning muscles. If choroidal tubercles had been noted during the attack, they were present during the remission. Cutaneous hyperesthesia is common, and the temperature of the body generally subnormal. The cerebro-spinal fluid still exhibits a lymphocytosis, and the mental and psychical states differ markedly from their condition previous to the attack. These observations show that the disease is only dormant, and the bacilli may awaken any moment to fresh activity, this time fatal. In this tendency to lie dormant and break out with greater vigor later, meningeal tuberculosis follows the rule of tuberculous lesions elsewhere, but the much greater importance to life of the structures involved, and their greater delicacy, limit strictly the number of possible attacks. Still, the fact of remission points out a line of treatment; during it we must do all we can to strengthen the resistance of the organism; perfect hygienic surroundings, abundance of good food and pure air, with suitable drugs. Stress is laid on the value in treatment of calomel, potassium iodide and creosote; lumbar puncture, too, though its greater use is probably for diagnosis, in a definite degree alleviates symptoms.

Infantile Juvenile Tabes.—HIRTZ and LEMAIRE (La Presse Médicale, 1905. No. 40). The existence of true tabes dorsalis in children has been doubted by many authorities, and nearly all agree as to its rarity. Ormerod, in Allbutt's system, says that it is almost unknown, and that the few cases recorded, after carefully separating cases of Friedreich's hereditary ataxy, do not quite tally with tabes as seen in adults. Hirtz and Lemaire record forty-seven cases in which they consider the diagnosis of infantile tabes to be beyond question. They admit that pupillary troubles, disturbances of tendon reflexes and lymphocytosis of the cerebro-spinal fluid are characteristic as much of nervous syphilis as of tabes, but they point out that when a youthful patient presents a symptom-complex of lightning pains, visceral crises, disturbances of sensation, reflex iridoplegia, loss of knee-jerk and urinary incontinence, it is not possible to avoid the diagnosis of tabes, even though the ataxy may be wanting. They arrange the symptoms as they occur in children in the following order of frequency, viz., incontinence of urine, lightning pains, amblyopia, gastric crises. This is not the order in which they are found in adults. Incoordination is generally little marked, being specially noticeable in two cases only of the forty-seven. The syphilitic origin of the disease is insisted on, with the obvious qualifications that the syphilis is inherited in such cases. One of their patients cited bears this out in a remarkable degree. The subject of undoubted congenital syphilis, he was attacked with gastric crises at the age of six years, and was under observation at the age of twenty-three, when he exhibited in addition to the visceral crises, Argyll-Robertson pupil, loss of knee-jerks and a spontaneous fracture of the os calcis. The author concludes by pointing out that tabes is an uncommon manifestation of hereditary syphilis, the usual one being a diffuse inflammation of the cord and membranes; that the spinal cord of the child seems to offer a special resistance to degeneration of the posterior columns, and that in all cases in children the evolution of the disease progresses very slowly.

Disturbed Dentition of the Third Molar.—M. L. RHEIN (Journal A. M. A., October 14). The surgical aspects of abnormal eruption of the third molar are discussed. The author points out the effects of lack of space at the angle of the jaw, as productive of grave disturbances, and calls attention to the possibility of its producing infection of the inferior dental canal as well as symptoms of irritation of the dental nerve. In some mouths the jaws come so close together that traumata of the gums over the affected place are constantly being produced. The crowding of the third molar against the already erupted second may produce serious inflammatory reaction and infection. The symptoms may be neuralgic pains radiating to the ear and even to the neck, shoulders and arms, difficulty in opening the mouth and marked febrile phenomena. Prompt excision of the entire hood of gum tissue is called for, and extraction of the tooth in case there is evidently too little space for its proper eruption. In many cases, however, the tooth can be brought into proper alignment and a strip of gauze packing, frequently changed, should be applied around the whole circumference of the tooth, and between it and the gum, together with proper disinfection of the mouth. In the most serious cases, the disturbances do not abate after partial eruption of the tooth, it being prevented from complete eruption, and every effort should be made to assist proper development. If this is clearly impossible, extraction should be done at the earliest moment, even if it requires cutting away a portion of the mandible. Delay increases the danger of neuralgic complications and infection of the inferior dental canal. Rhein thinks these cases are often misunderstood and mistreated by physicians, with the result of needless facial disfigurement. On the other hand, he says that dentists should be cautious in regard to extracting such teeth if they can be saved, and should not neglect proper sterilization and after care.

Pneumonia in the Young.—E. F. WELLS (Journal A. M. A., October 14), points out that pneumonia is most frequent in early childhood, and next most frequent in full maturity from 30 to 50 years of age. He limits the term to pneumococcal infection and the fact that the pneumococcus is present in the mouths and upper respiratory passages of probably 50 per cent. of healthy persons accounts for the frequency of the disease. He has never failed to find the pneumococcus in several hundred examinations of persons who have had pneumonia. But he has not found it in recently born infants, which accounts for the infrequency of the disease in the very earliest periods of life. Once the throat becomes infected, however, the child is liable to pneumonia. The symptoms, high temperature, rapid pulse and breathing, pain, cough, the well-known expiratory grunt, the loss of appetite and the physical signs are described. The chill which is usually conspicuous in adults is absent in young infants and is infrequent in young children. The child is usually dull and apathetic, surface pallor is the rule. The duration of the disease is shorter in infants than in adults, and unless some complication like empyema intervenes, usually ends by crisis, or less frequently by lysis, in a week or more. Serious complications are more frequent in children. Serous pleurisy is less common than in adults. In case empyema intervenes, it is generally limited by adhesions, and if left alone usually evacuates itself into a bronchus or externally, and after a prolonged convalescence, complete or partial recovery occurs or the child may be worn out and die from exhaustion. These cases are usually recognizable, but, if in doubt, he advises using the exploring needle without hesitation. Other complications mentioned are otitis, with rare meningeal involvement, but usually recovery without impairment of hearing is the rule. Abscess, pericarditis, peritonitis, arthritis and endocarditis are rare. The prognosis of infantile pneumonia is unsettled by statistics, but Wells thinks that in private practice at least it is better than in the adult. The treatment necessarily must be more or less individual. The healthy child must be kept out of the way of the infected one. Exhaustion and too profound sleep must be guarded against in the infected child and the fluids of the body, whether intravascular or extravascular must be cleansed of the soluble toxins. Wells would give the child with pneumonia plenty of liquids to drink and, in addition, normal salt solution by rectum if necessary. Theoretically, this washes out the toxins. Practically, Wells employs and advises it. In his practice he gives moderately large doses of a reliable tincture of digitalis with the enemata if they are retained. Other vaso-motor tonics may also be given. For high fever and restlessness, he prefers tepid sponging followed by alcohol, repeated as required. This failing, he uses guaiacol in suitable dosage to the thin skin of the flexures, supplemented by the ice cap at intervals. Oxygen inhalations are useful when the patient is not fretted by their use. Strychnia, aromatic spirits of ammonia, etc., may be used as required. In case of profound nervous failure with apathy, abdominal distension, etc., the little patient may be aroused by a stimulating glycerinated enema. The best medical attention and nursing and fresh air are required, and the child should be disturbed as little as possible. Complications should receive prompt and careful attention, and in those requiring it (especially if empyema be present) prompt surgical relief should be afforded.

Generalized Diphtheritic Paralysis.—G. Raviart and L. Dubar (L'Echo Medical du Nord, March 5). Although paralysis is a frequent complication of diphtheria (occurring, according to Gassicourt, in over 23 per cent. of the cases), it is usually limited to the palate with or without implication of the pharynx and larynx. But there is a rare generalized form in which the eyes, trunk, limbs, sphincters, respiratory muscles and heart are involved. This form is also accompanied by sensory derangements, and bilateral deafness and optic neuritis have been observed. A woman, aged 29 years, contracted diphtheria, which began on the left tonsil and extended to the other side, and later to the nose. For twelve days her state remained grave, but she then made good progress till the thirtieth day of the disease, when on swallowing, liquids passed into the nose and at times into the larynx. Examination showed paralysis of the soft palate, chiefly on the left side, and paralysis of the adductors of the vocal cords. The palate and surrounding parts were also completely anesthetic. While the difficulty in swallowing improved, the patient noticed defect of vision for near objects. She could read only large type when placed at least 20 inches from the eyes. Distant vision was intact. Left internal strabismus then developed, with occasional diplopia. The pupils were sluggish; the left was larger than the right. About the same time slight paralysis of the lips was noticed, with escape of saliva during the night. The abdominal muscles were then involved, the patient being for some days unable to make efforts to defecate, and for two days the anal sphincter was paralyzed. Some increase of the paralysis of the ocular muscles and palate occurred during the menstrual period a week later, and as this improved the extensor muscles of the lower limbs became involved and the patient became ataxic. When the paralysis of the lower limbs attained its maximum the difficulty in deglutition had disappeared, but paralysis of the extensors of the upper limbs took place, extending to the trunk, so that for almost a month there was generalized paralysis, and she could neither stand nor sit upright. The left arm and right leg were most severely affected. There was no paralysis of the face, tongue or diaphragm. The reflexes were entirely abolished. Sensation was impaired all over the skin, especially in the neighborhood of the hands and feet. For some days at the beginning of the paralysis of the limbs there was loss of sense and taste. The patient became extremely emaciated and the muscles seemed to have atrophied. Improvement began about six weeks after the onset of the paralysis and was very gradual, the arms recovering first; but it was not till two months later that the return of motion and sensation was complete, the paralysis having lasted three and one-half months.

Measles Without Eruption.—Salzer (Münch. Med. Woch., Feb. 21, p. 360). The occurrence of measles without eruption has been denied by many authorities. Thus, Monti states that in cases supposed to be examples of morbilli sine morbillis the rash has probably been overlooked. Even Henoch (Lectures on Children's Diseases, New Sydenham Soc.'s Translation, Vol. II, p. 261) had never seen an assured one. The writer, with fifty years' experience, has met with his first case recently. In a family of six children a boy, aged eight, was attacked by measles on Oct. 30, 1904. He was immediately removed from the house and isolated. But on Nov. 10 his four sisters, twins, aged nine months and three years, respectively, showed prodromal symptoms with red patches on the palate. In three of them the measles ran a normal course, the eruption being fully developed on Nov. 13. But the fourth, one of the twins, aged 9 months, was seized with severe bronchitis. She had always been weakly, and weighed only 13 pounds. The pyrexia, which often reached 104 degrees, persisted for a fortnight. Although the writer was visiting twice a day, neither he nor the nurse and mother saw a trace of an eruption. The bronchitis was accompanied by frequent cough and vomiting. On Nov. 27 the temperature fell to 99.5 degrees, general convulsions appeared, and on Nov. 29 death occurred. Schültx (ibid., March 21, p. 557) considers cases of measles without eruption to be commoner than is supposed. During an epidemic of measles his three children developed prodromal symptoms. In his daughter, aged seven, there were a typical eruption over the whole body, photophobia, cough, capillary bronchitis, and pyrexia, which reached 104.9 degrees. But in a daughter aged nine and a son aged six, though there were all the symptoms of measles—pyrexia (up to 103.1 degrees), severe conjunctivitis and bronchial catarrh—there was no trace of an eruption either on the palate or the body. The cases without eruption were, unlike the one published by Salzer, of a comparatively mild type. In the case with eruption there was extensive capillary bronchitis, but in the two cases sine morbillis the pulmonary symptoms were slight.

Pneumococcic Arthritis in a New-Born Child.—NATTAN LARRIEG (Archives Gén. de Med., Feb. 28, p. 528.) The following case, which was observed in the clinic of Prof. Dieulafoy at the Hôtel Dieu, Paris, appears to be the only one on record in which pneumococcus arthritis was observed in the newly-born. A male infant was born after a difficult first labor on Sept. 5, 1904. He was the subject of hare-lip and cleft palate. On the 8th a plastic operation was performed on the lip. He progressed favorably until the 12th, when there was a little seropurulent discharge from the orifices of the sutures. When the latter were removed, on the 15th, union was found to be very incomplete and the wound was covered with pus. On the 20th the edges of the wound were greyish-red and covered with pus. The general condition was bad; there were vomiting and fetid stools, and he lost weight. On the 24th his mother noticed that he cried when placed on the right side or when the right arm was touched, and that the right shoulder was red and swollen. On the 25th the swelling was greater and the arm immobile. On the 20th he was taken to the hospital. He was wasted and pale and the fontanelles were depressed. There was considerable swelling of the right shoulder-joint, which was of the size of a mandarin orange; the overlying skin was red and edematous and showed dilated veins. Deep fluctuation was felt at the anterior border of the deltoid. Purulent arthritis was diagnosed. Disseminated râles were heard all over the chest. The spleen was palpable. The temperature was 100 degrees in the morning and 101.5 in the evening. On the 27th the skin was dry, the eyes were sunken, the temperature was 104.2 degrees, and death occurred.

Necropsy—Thick, viscid, greenish pus—typical pneumococcic pus—was found in the right shoulder-joint. The synovial membrane was thickened and reddish, and covered in places by an adherent fibrino-purulent layer. The articular cartilage was roughened and eroded. The lungs were congested and edematous, especially at the bases. There were no signs of pneumonia or broncho-pneumonia. The pus contained disintegrated leucocytes and a large number of diplococci, which on staining and on culture were proved to be pneumococci.

Of thirty-one cases of pneumococcic arthritis collected by Dr. E. J. Cave (Review, 1901, p. 75) only two occurred in children, at the ages of five and eight years respectively. Pneumococcic arthritis usually is secondary to pneumonic or broncho-pneumonic infection (in 28 cases out of 32). In this case neither was present, and the source of infection evidently was the wound in the mouth, for the pneumococcus was found in the pus. As the organism often occurs as a saprophyte in the mouth, infection of wounds in this locality might easily occur.

Retinitis in Parenchymatous Nephritis in a Child.—George Carpenter M.D. (Ophthalmoscope, April, p. 159). A girl, aged ten years, was admitted to hospital on Nov. 23, 1885, Her illness began in June, 1884, with sickness, headache and severe abdominal pains. Pain followed the sickness, and she had as many as five attacks in a fortnight. They recurred up to the time of admission. On Nov. 7, 1885, blood appeared in the urine, and since then had been noticed in varying quantities. She was well nourished, but of a sallow complexion. The pulse was 96, small and hard. The cardiac impulse was heaving and diffuse, and 1¼ inch external to the nipple line. The urine was of s.g. 1,015, and full of blood. It contained pus cells and granular and hyaline casts. Five days later it was apparently free from blood, of s.g. 1,012, and contained one-eighth albumin. About a pint was passed in twenty-four hours. Severe neuro-retinitis was found in both eyes. The left disc was swollen and enlarged. The vessels were partially buried in exudation; they bent as they crossed the edge of the disc, and beyond it were partially obscured by a whitish haze. Just below the disc was a small hemorrhage. Radiating from the edge of the disc to the macula was an irregular-shaped area of paper-whiteness underlying the retinal vessels. It had a defined edge and somewhat striated appearance. At the macula were a number of minute yellowish-white dots. Above the paper-white area were a large number of small yellowish-white spots of varying size underlying the retinal vessels. The right disc was in much the same condition as the left, showing vessels partially buried in exudation and small hemorrhages. At the macula and between it and the margin of the optic disc, radiating fanwise towards it, were paper-white patches underlying the retinal vessels. At the macula some were well defined, others were not so. Between the macula and the disc the patches were well-defined, and finally became merged in the haze of the disc. Along the course of and beneath the vessels on the yellow-spot side were small yellowish-white patches of various shapes.

On Nov. 30 the urine was free from obvious blood; it contained hyaline and large and small granular casts.. Two epithelial casts and some blood-red corpuscles and blood casts were seen. Some of the renal cells were normal in appearance; others were undergoing fatty degeneration.

On Dec. 1 and 3 there was one-third of albumin in the urine, a few hyaline and granular casts, and some scattered red-blood corpuscles. The s.g. was 1,014. During December, 1885, and January, 1886, she passed on an average of about two pints of urine daily of s.g. about 1,014. Blood in quantity was a frequent occurrence, sometimes the color of arterial blood, at others of a brick-red hue. The most albumin passed in an apparently blood-free specimen was one-half. Several times she complained of headache and feelings of nausea, and once or twice she was sick. On Feb. 17 she complained of great pain in the umbilical region, which lasted for half an hour. After this attack blood clots of a bright-red color, varying in size from a silver penny to swan-shot, were found in the urine. Abdominal pain occurred without blood clots in the urine during April, and on the 8th of that month the urine was nearly solid with albumin. Some edema was then noticed for the first time about the ankles. The parents removed her from hospital. She died soon afterwards. A doctor who attended her at her home sent her kidneys for inspection. They were "large white" kidneys. The pelves and ureters were enlarged and thickened.

Diffuse Myositis Ossificans.—R. Horand (Lyon Médical, March 5, p. 536). A girl, aged seven and one-half years, previously healthy, while suffering from whooping cough had a great fright, to which her mother attributed her illness. About the same time she sustained a severe fall on the head, producing a wound on the right frontal region. Three weeks later a tumor as large as a hazel-nut was noticed on the back of the shoulder and rapidly grew. There were somnolence, repeated epistaxis and general weakness. When first seen, a month after the onset of these symptoms, she walked with a slight inclination to the right. There was a tumor of the back extending from the base of the skull on the right of the middle line to the lumbar region. The right shoulder was raised and the contour of the scapula was concealed by the swelling, which threw into relief the posterior axillary line and ceased just above the iliac crest. The skin was adherent at places, especially over the more prominent portions, but on palpation the mass was found uniformly firm, without either hard nodules or softened parts. The right trapezius was thickened and indurated, while in the corresponding muscle of the left side there was a small mass which seemed to be of the same nature. In the axilla some branching vessels entered the tumor.

Two months later the swelling seemed to have decreased at the upper part, but had increased over the posterior iliac spine. The skin remained adherent. When seen after an interval of five months the large swelling on the back of the chest had disappeared. On each side of the chest below the scapula, a little behind the posteriar axillary line, was an exostosis as large as a mandarin orange. These were sessile and adherent both to the ribs and to the skin. There was slight scoliosis with rigidity of the spine, especially in the lumbar region. The neck was also stiff, the head being inclined to the right side. To the right of the middle line was a hard swelling, beginning about the last ribs and extending to the pelvis, covering the posterior part of the crest of the ilium. This had the characters of a large plate of bone, which seemed fixed to the corresponding part of the pelvis. There was some tenderness on pressure, but no acute pain. The anterior border of the right trapezius was thickened and bony to the touch, and a similar condition was present in the deep muscles of the neck and the right sterno-mastoid. When the patient lay on her back she was unable to sit up or turn on her side without assistance. For some time she had suffered from stiffness of the right shoulder and could not abduct the arm more than 8 inches. This was entirely due to the implication of the teres major and minor and the pectoralis major. A similar condition began in the muscles of the left shoulder about a month before and the lesions were less advanced. The biceps was attacked and the elbow could not be extended beyond 100 degrees. On mechanical stimulation the biceps was found to retain some contractility, but its electrical response was much diminished, while the reaction of degeneration was not complete. The muscles of the face, abdomen and lower limbs were intact, but there were exostoses at the lower extremity of both femora. The intellectual and sensory functions were normal, the reflexes being perhaps slightly exaggerated. Both great toes were shortened and in a condition of hallux valgus, but there was no ankylosis. The thumbs were normal, but the last phalanges of the little fingers deviated outwards. Radiographs gave only slight traces of the affected muscles, but showed the shortening of the great toes and the first metatarsals and metacarpals more squat and dense than usual.

The case is interesting in consequence of the age and sex of the patient. Myositis ossificans usually begins from the age of two to five years, and attacks boys in the proportion of three to one. As in this case, it proceeds by attacks with intervals of remission, the duration of which is variable, but a fatal termination usually takes place about the age of ten or twelve years. Death may result from some pulmonary affection, respiration being interfered with by invasion of the external respiratory muscles, or ossification of the muscles of the jaw may contribute to the fatal issue. Treatment has hitherto proved unsuccessful.

Acute Lymphatic Leukemia in Infancy.—R. C. Larrabee (Boston Med. and Surg. Jour., Jan. 12, p. 40). A girl, aged 6 weeks, the only child of Russian Jews, was born after an easy labor on May 14, 1903; she weighed 6¾ pounds, and appeared to be normal. She was breast-fed, but after the sixth day, as she cried incessantly, the breast feeding was supplemented by a mixture of milk and boiled water. On June 25 she was taken to hospital for slight diarrhea and vomiting, which had existed for a day. She was fairly developed, but poorly nourished, weighing 7 pounds. The liver was normal. The spleen was felt extending from under the ribs to slightly below the level of the umbilicus; its edge was sharp. Numerous nodules, varying in size from a pea to a marble, were felt in the groins and the axillæ. The abdomen was slightly distended, tense, and apparently tender. On June 27 examination of the blood showed hemoglobin, 60 per cent.; red corpuscles, 4,392,000, and white corpuscles, 918,000. A differential count gave polymorphonuclear neutrophiles, 0.5 per cent.; small mononuclear basophiles (lymphocytes), 93.2 per cent.; large basophiles (large mononuclears and transitionals), 5.9 per cent.; and eosinophiles, 0.1 per cent. The basophile (non-granular) mononuclears, which comprised over 99 per cent. of the leucocytes, were of all sizes, so that the distinction between large and small forms was arbitrary. In some there was considerable protoplasm, but in most there was only a narrow rim about the nucleus. Some appeared like free nuclei. A prolonged search revealed a few normoblasts and mast cells. There was slight poikilocytosis. The digestive disorder was treated and arsenic was given, but even in minute doses it was badly borne by the stomach and had to be interrupted. Although the diarrhea was only partly relieved, the child gained one-half pound in weight and appeared to be doing well until July 25, when she was taken to hospital in a state of collapse, with marked cyanosis, dyspnea, retraction of the chest in breathing, and other evidence of obstruction of the larynx or trachea. There was no membrane in the throat, but in one nostril was a small, yellowish mass, the nature of which in the child's condition could not be ascertained. The voice was not entirely lost. There were a few small hemorrhagic spots on the abdomen. The child died before an operation could be performed. A necropsy was not allowed. Leukemia was observed at the age of six weeks, which appears to be the earliest period at which the disease has been recorded. Cases have been reported at the ages of 12 weeks, 9 months, 1 year, 13 months and 20 months. The disease is much rarer in infancy than in later childhood. The present case ran its course almost without symptoms suggestive of the diagnosis. Hemorrhages into the skin, a frequent symptom, occurred only on the day before death. But for the rule at the hospital to make a thorough physical examination of every patient and to examine the blood in every case presenting enlargement of the spleen or lymphatic glands, the case would have been regarded as an ordinary one of summer diarrhea. At first the respiratory obstruction was supposed to be due to diphtheria, but opposed to this were the facts that the voice was not entirely lost and there were no other evidences of diphtheria. Perhaps the obstruction was due to enlargement of the thymus, which, according to Pinkus, is always present in leukemia; or to leukemic infiltration of the mucous membrane of the larynx, which has also been observed.

On Hypertrophy of the Pylorus in Infants and Its Medical Treatment.—Few morbid conditions of infancy have aroused so much attention during recent times as hypertrophy of the pylorus, and in few has the growth of our knowledge been so satisfactory. Within the last ten years we have seen it pass out of the ranks of mere pathological curiosities, and become recognized as one of the diseases which any practitioner may expect to meet with and which he ought certainly to be able to recognize. Within the last seven years a number of surgeons throughout the world have shown us that many of the cases may, if taken in time, be restored to permanent good health by operation.

Now a further important step in advance is being taken. We are coming to see that some of the cases formerly regarded as only to be saved by operation, if at all, will recover quite as satisfactorily under medical treatment only, provided this is begun early. It is also becoming evident that infants who are too weak for any surgical procedure may sometimes be saved by medical measures properly carried out. It is this—the physician's side of the question—which forms the most interesting part of most of the papers which have recently appeared.

The following abstract is taken mainly from an article by G. F. Still (Lancet, 11th arch, 1905), and Dr. Jussuf Ibrahim ("Die angeborene Pylorusstenose," Berlin, 1905).

Pathology.—The only essential post-mortem appearance in these cases consists in great thickening of the muscular coat of the pylorus and stomach. Into the vexed question as to how this condition is brought about (if it exists at all, which some still deny) we need not at present enter further than to mention the three iews regarding it which have been put forward. These are as follows:—

1. *Pfaundler's.*—That there is no real muscular hypertrophy present and no stenosis, and that the appearance of thickening as well as the obstruction are due solely to spasm of normally developed muscle.

2. *Thomson's.*—That there is great hypertrophy of muscle, and that this is the result of antecedent overwork, probably from nervous inco-ordination. Also that there is no stenosis beyond that which is caused by spastic contraction of the thickened muscle.

3. *Hirschsprung's.*—That there is real stenosis as well as great hypertrophy; and that the latter is primary in origin and not the result of antecedent over-action.

We gather that Dr. Still agrees with the second, and Dr. Ibrahim with the third of these views.

Symptoms.—The first important paper dealing with the symptoms of the disease was published by Hirschsprung in 1888. In 1896 a considerable number of papers appeared by Finkelstein and others in various countries, so that the condition soon became recognized in all children's hospitals.

The grounds for a diagnosis of hypertrophy of the pylorus may be summarized as follows:—The patient is healthy at birth to all appearance, and often a particularly fine child. The vomiting, which is almost always the most striking symptom, occasionally sets in immediately after birth. Generally, however, it does not begin for some days or weeks, and may even commence as late as the ninth week. It often starts without apparent cause while the patient is being carefully fed on the breast or bottle. Ordinary treatment by medicine and change of diet only affects it slightly for a day or two at most. At first the vomiting may be slight and uncharacteristic, but soon it becomes frequent and very forcible. The vomited matter is large in amount, representing more than one meal, and it scarcely ever contains any bile. There is no diarrhea, and the motions and the urine become very scanty if the vomiting is urgent. The child's weight falls rapidly and he becomes extremely emaciated.

The presence of such a group of symptoms during the first few weeks of life should always suggest the possible presence of this disease. They make its presence, indeed, very probable. The diagnosis, however should *never* be made unless exaggerated visible gastric peristalsis is seen, or a palpable tumour found in the pyloric origin.

The visible peristalsis is a very striking phenomenon. A rounded swelling from half a large walnut to half a Tangerine orange in size, appears at the left costal margin, and passes slowly across the abdomen towards the right. Before this tumor has reached the middle line, a second similar one will be showing from under the left costal margin; and sometimes a third may be appearing there before the first has disappeared in the right hypochondrium. The movements can be seen from a considerable distance. They have, however, to be watched for, for they may be absent for hours at a time. The phenomenon is due to vigorous attempts on the part of a hypertrophied stomach to drive its contents through a contracted pylorus. When it occurs in a young baby with history of chronic vomiting it amounts to a proof of the presence of this disease.

The other pathognomonic symptom is the recognition by palpation of the hypertrophied pylorus. Like the peristalsis, this is only to be made out occasionally during contraction, as a relaxed pylorus is scarcely palpable. The tumour is sometimes very difficult to make sure of for those who have not felt it before. When it is felt, however, it forms very valuable confirmatory evidence.

Surgical Treatment.—Stern was the first to attempt to cure the condition by surgical measures. The operation which he performed—gastro-enterostomy—was, however, unfortunately unsuccessful. In the following year the same operation was successfully carried out by Löbker and by Kehr. Their success may be said to have ushered in the surgical phase of the subject. Since that time a large part of what has been written about it has dealt with the indications for surgical interference, the choice of the operation to be done, and the best ways of doing it.

Gastro-enterostomy has been the operation chosen most frequently, and it has been successfully performed by Löbker, Kehr, Fritsche, Jäckh, and Trantenroth on the Continent; by Anstey Giles in Australia; and by Stiles in this country.

(To be continued.)

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In a treatise "On Exodin as a Purgative for Puerperal Women," Dr. Otto Schmechel records an extensive experience with exodin in the clinic of Privy Councillor von Winckel at Munich. It was given to 100 subjects, mostly young and healthy puerpera whose confinements had been normal, but who had no passage for three days after delivery. They all took it without any trouble whatever; there was no difficulty in swallowing the tasteless suspension. Never was there disgust or nausea.

The results were in accord with those of Prof. Ebstein and Dr. Stauder; passages were procured without any trouble whatever. The dose of 22½ grains, however, which they found to be always sufficient, gave some failures, and to assure certainty of effect in these puerperal cases it was necessary to give a dose of 30 grains. Once the drug caused some tenesmus and a thin evacuation, but no other case of diarrhea was observed. The stools were sometimes formed, but usually mushy and brownish. They never contained mucus or any other indication of intestinal irritation.

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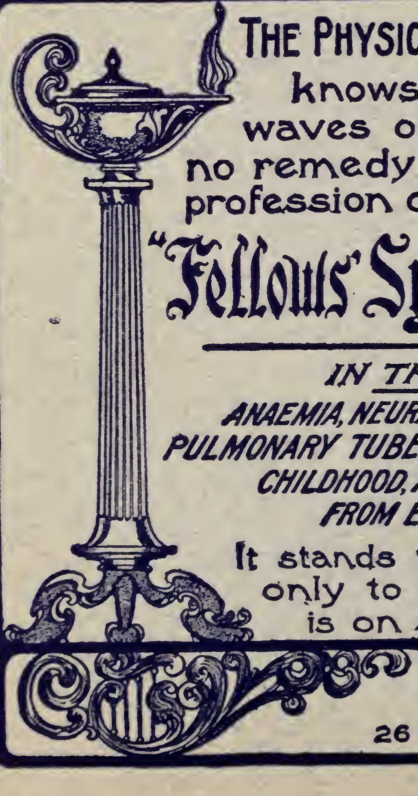

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